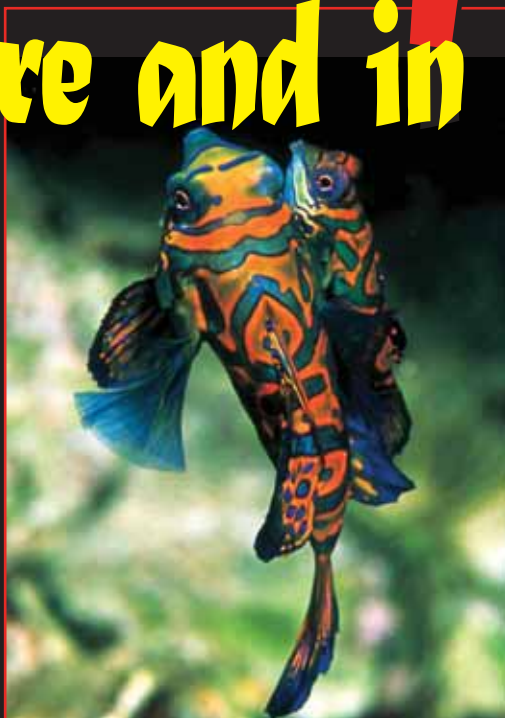
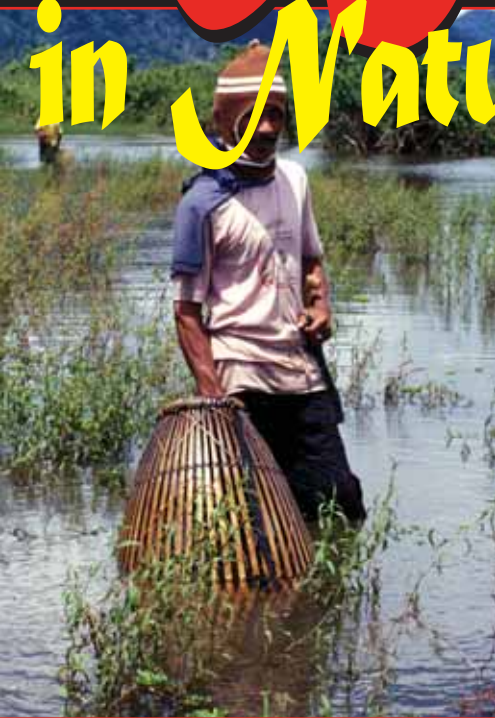




# Bleher's Biotopes

in Nature and in Aquaria

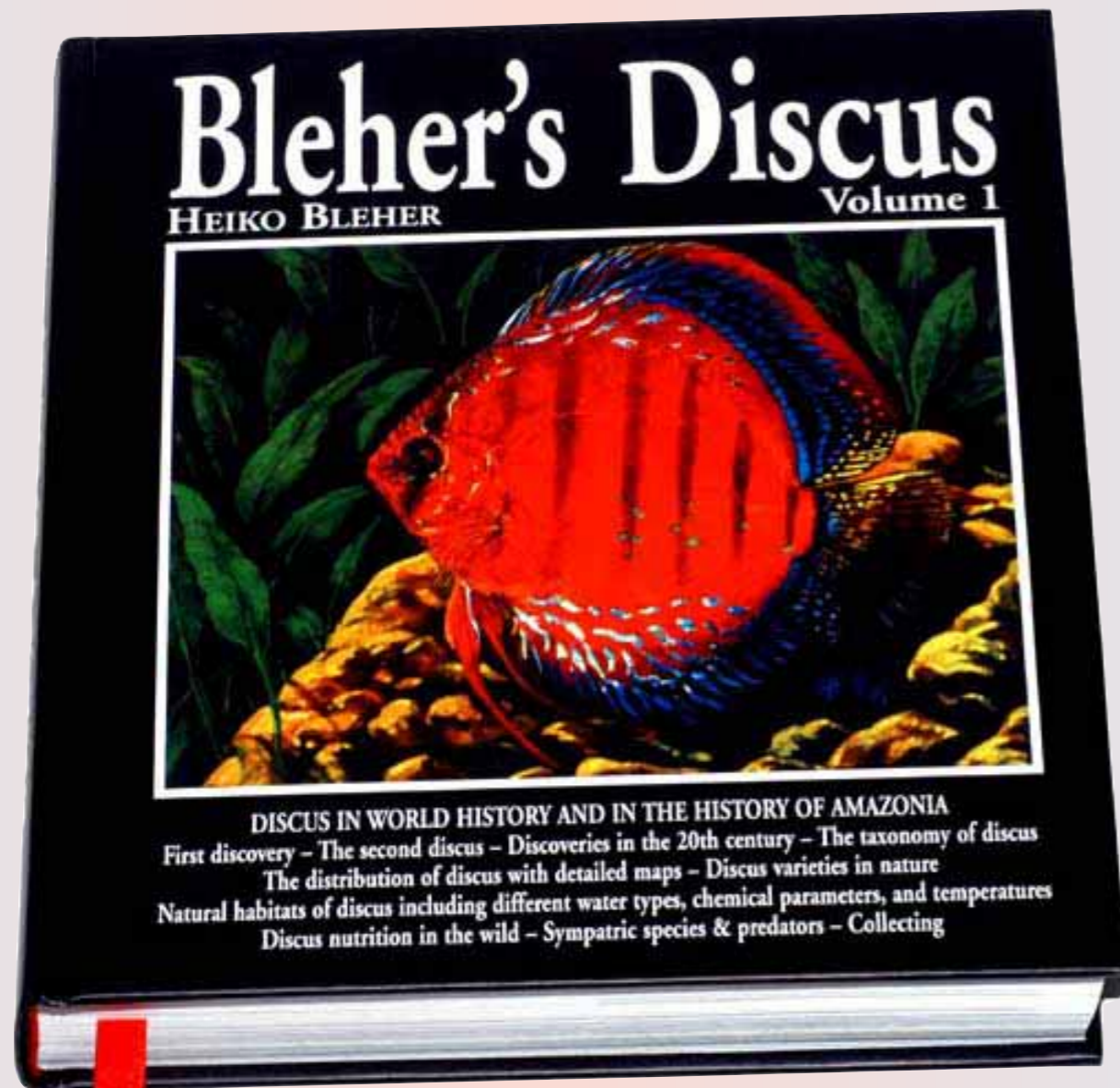


# Bleher's Discus – A Monograph

## An unsurpassed and comprehensive study of the genus *Symphysodon*

Whether it was the Emperor Napoleon or Prince von Metternich who was responsible for the original discovery of the discus is something the reader himself must decide, but the rest of this more than 1300 page work – published in two volumes – is far from ambivalent.

In Volume 1 – containing around 5000 photos, paintings, and drawings, plus some 50 maps – Heiko Bleher first of all guides you through more than 150 years of discovery, documented in the finest detail. He brings to life all the scientists who have worked on the genus – with in part unpublished work and photos – and, after almost half a century of debate regarding the systematics of the genus, provides a new and easy-to-understand summary of the taxonomy. Next, the distribution of the genus and the individual species is shown practically down to the smallest igarapé or lago, on eight double-page maps. For the first time with precise details of water type, researched in the field. In the fourth chapter Bleher covers all the wild forms known to date (some hitherto unpublished) and their colour variants, in words and photos – the results of his more than 300 research and collecting expeditions. The locality data have been extensively checked in the field over the years up to 2005. In Chapter 5 he guides the reader through the history of Amazonia – back to the time of its discovery – and tells extensively about the early history of the region and the numerous indian tribes (mainly personal experiences among the aboriginals). In addition the natural habitats of the discus are described and illustrated, with water parameters (measured by both day and night) given for 75 different locations; almost every major water in Amazonia is mentioned at length, with details of which form(s) do or do not occur there; and places that remain unexplored to date are listed. He also details extensively – more than 80 pages – the diet of the discus in nature, the communities of which it forms part (with sympatric species listed) and its enemies, as well as the various methods of capture used from the beginning to the present day.



### Editorial:

### Bleher's Biotopes in Nature and in Aquaria



Dear Reader

I wanted to thank Premiere Publishers to give me the opportunity to make such a unique Catalogue for the second time, after the tremendous success of volume 1 which was sold with over 10,000 copies throughout the Russian Federation and elsewhere. It is a pleasure for me to present to you the second volume of Bleher's Biotopes in Nature and Aquarium, again with exciting destinations, habitats and biotopes from around the world and to provide the Russian people with information about the aquatic world from five continents.

In this issue I show you once more the real aquatic world in nature, expeditions, how to collect aquatic creatures and plants, to bring them back alive and introduce them into this, the most beautiful hobby.

First I will take you to Kasuku, an unexplored lake in Central Africa, in an area never visited by white Man before, show you the extreme difficult access and the beauty of its nature. But also what is happening to the wildlife, the animals, since Man has "protected" them. Before their international "protection" some of these "protected" species were once in awhile collect a life and sold to Zoos, Institutions, pet dealers and pet lovers who care. With this the natives had some income. But since they cannot be ex-

ported any more, the locals kill and eat them (to survive)... Most of today's animals have no chance of survival in their natural habitats, if above or below the water. The continuous destruction of nature and the natural environments around the world and specially in the tropics where the biodiversity is (was?) the greatest. The Red List of Endangered Species, the most reliable source today for life forms on planet earth have just published its latest report for 2007: "According to the World Conservation Union, (IUCN) which draws up the annual List, the extinction rate is up to 10,000 higher than expected. Human activity causing loss of habitat through urbanisation, agriculture and deforestation combined with climate change is revealed to be the biggest threat to plants and animals. There are now 41,415 species on the Red List and 16,306 are threatened with extinction, up from 16,118 last year. The total number of extinct species has reached 785 and a further 65 are only found in captivity or in cultivation. Life on earth is disappearing with species hurtling towards extinction at an unprecedented rate..."

My second report is also about an unexplored aquatic habitat in the heart of the Amazon, a gigantic river, which had not been researched before. It is a large, crystal clear, left-hand affluent of the mighty Xingú River. The latter's aquatic creatures are also being threatened now, as soon they will build a hydroelectric dam at the sight where the endemic *Hypoancistrus zebra* lives, the so called L-46 catfish, the most loved catfish in the aquarium hobby world wide.

I than take you to Assam in India, where many of our aquarium fishes come from as well in recent years, after I have been able to discover quite a few interesting small species there and also the dwarf *Channa*, a dwarf snakehead fish which was named in my honour (*C. bleheri*) and this mouth brooder has become one of the most asked for Indian fishes today.

On the Australasia archipelago, actually on the island New Guinea, I am taking you to another very clear aquatic habitat, to the unique Lake Kutubu with several endemic fish species, I also introduced some of those into the hobby years ago and people love them, in particular the blue rainbow fish *Melanotaenia lacustris*.

The famous Swiss photographer and diver, Franco Banfi contributed to this catalogue with a magnificent report on the Lembah Strait in northern Sulawesi (formerly Celebes) in Indonesia. His photos are all made at night, to appreciate the amazing behaviour of the aquatic animals in marine habitats at this time and to see what most of you do not see (as I believe the majority of you sleeps at night...). One can see the camouflage of many different species and learn (much) more about their life cycle.

At the end I have included two biotope aquarium decorations (and information) on freshwater stingrays and discus fishes, which both are very popular today and many of them breed in Russia and elsewhere. They are some of the most fascinating aquarium fishes and specially the discus the most precious of all freshwater fishes in this magnificent hobby (the reason why I wrote a large book on the subject: *Bleher's Discus* volume I, available in Russian language as well).

I will continue to bring to you tips of how to decorate the aquarium accordingly and maintain it – for beginners as well as for advanced aquarists. Show you the latest introductions into the hobby, talk about well known aquarium fishes and aquatic plants, as well as what is available in your pet shop – very well illustrated in each issue.

I remain, seeing forward to some of your comments, what you think of this new concept for the most beautiful and educational hobby on planet Earth. You can write to me at:

heiko@aquapress-bleher.com or visit my website [www.aquapress-bleher.com](http://www.aquapress-bleher.com)

Your nature lover – Heiko Bleher

### Bleher's Biotopes in Nature and in Aquaria

Published by: Aquapress  
Via G. Falcone, 11  
I-27010 Miradolo Terme (PV)  
Italy  
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Fax (+39) 0382 754129  
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[www.aquapress-bleher.com](http://www.aquapress-bleher.com)  
[www.aquapress-bleher.it](http://www.aquapress-bleher.it)  
[www.aquageo.com](http://www.aquageo.com)

**Editorship:**  
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Heiko Bleher and  
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**Photos:**  
Franco Banfi,  
Heiko Bleher,  
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**Design and Layout:**  
Aquapress Publishers, Italy:  
Rossella Bulla and Heiko Bleher

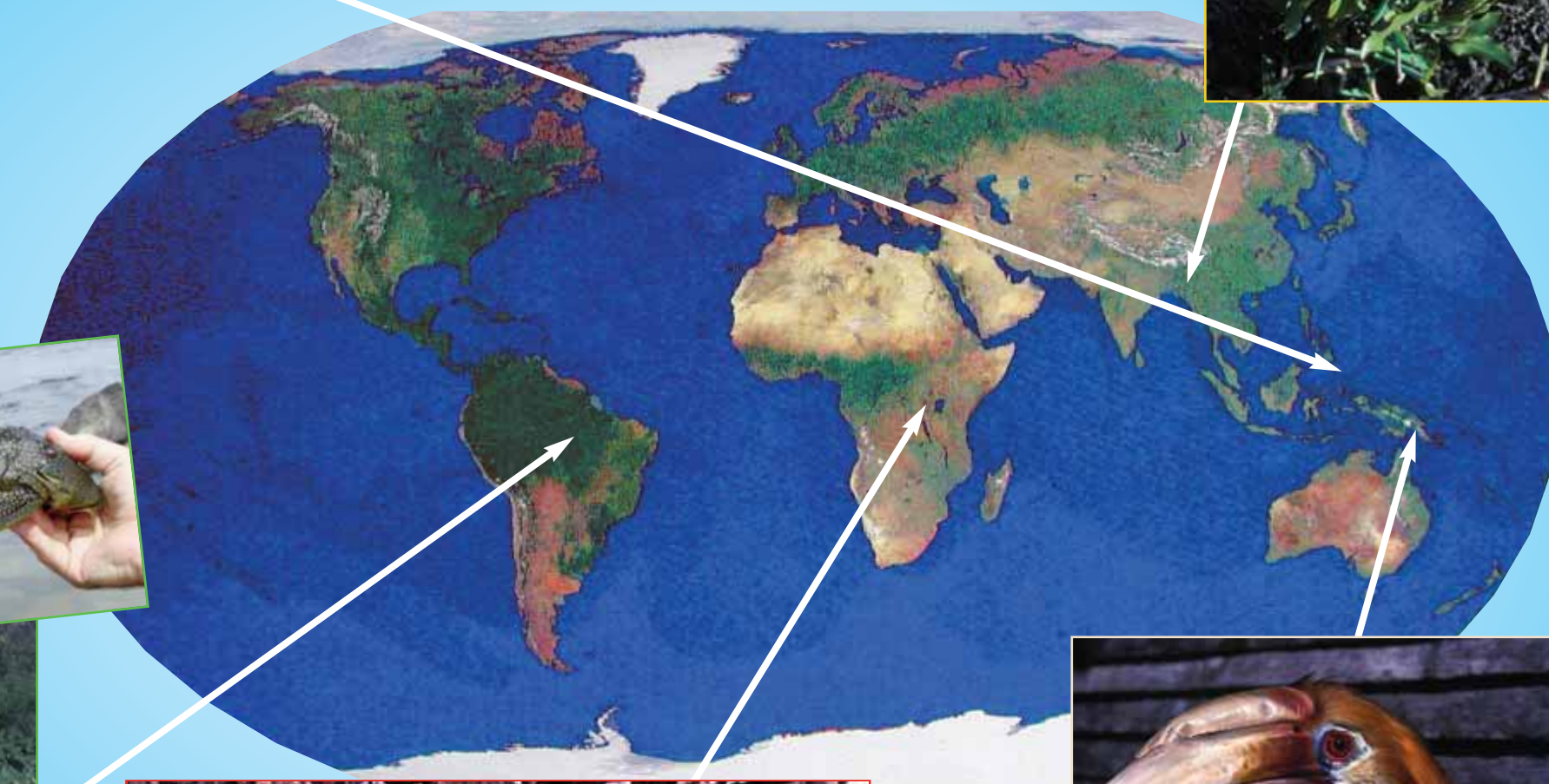
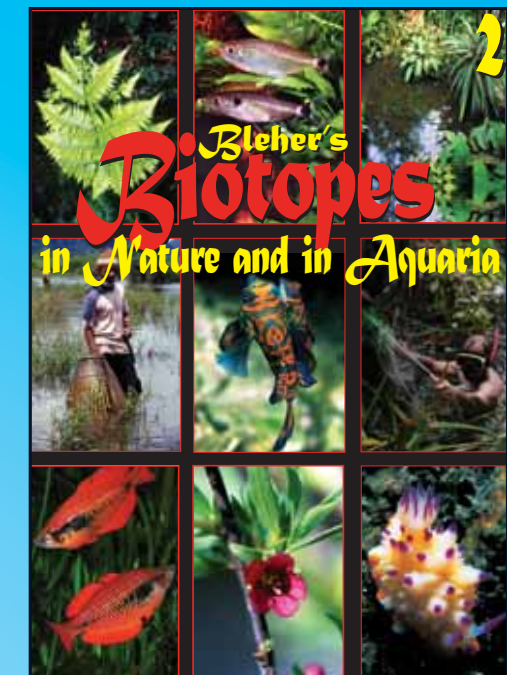
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ISSN 1126-8956

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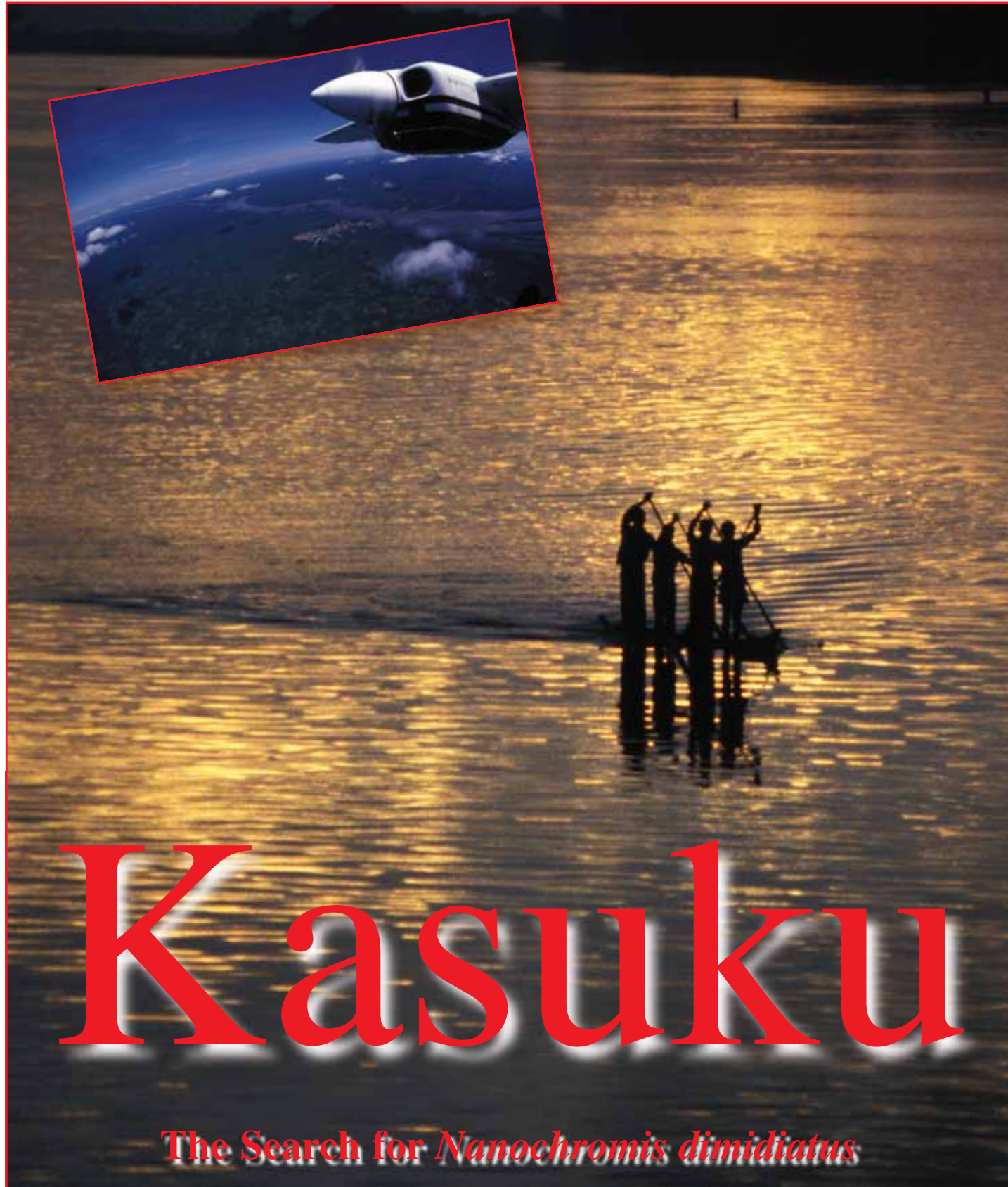


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# Kasuku

*The Search for **Nanochromis dimidiatus***

Kasuku is in Swahili the name for the African grey parrot *Psittacus erithacus* but also the name of an unexplored remote lake in the eastern part of the Democratic Republic of the Congo (former Zaïre).

Text : Heiko Bleher

Photos by the author unless otherwise indicated

The drums of the Warega tribe were beating away. It was a tremendously hot and humid night. I lay perfectly still listening to the through large holes in my net. A hundred years ago Livingstone lay there this same jungle. I imagined myself as him. Little has changed since that time, here in the virgin forest of one of the central African republics.

I was at a missionary station called Saint Esprit. This complex lies near (Port de) Kindu, about 200 miles south of the equator. Here was our base for the Kasuku expedition. Lake Kasuku is a mystery; it is uncharted on most map of the area and no roads or landing strips service it. It was at the time ichthyologically unexplored.

The incredible story I am about to tell begins many years ago. Pellegrin first described *Nanochromis dimidiatus* in 1900. But it wasn't until the late 50's that the famous fish collector and author Pierre Brichard exported these jewels live for the first time to Europe and the USA. After Pierre had left the Congo in the early 60's, no ever went back and dared to collect in this wilderness...

Since then, none of these colourful dwarf cichlids had been seen. Many fishes with this name were distributed to wholesale and retail outlets, but never the true *N. dimidiatus*. For years I wanted to search for it. Although I travelled often to Zaïre in the 70's and early 80's, I never had the opportunity.

I knew the fish only from old photographs and outdated literature. Most of this literature incorrectly attributed the name *Nanochromis dimidiatus* to another fish. Despite the lack of information – or perhaps because of it – I began to plan an expedition to Zaïre (today D.R. of the Congo) and find this rare and beautiful fish. My plan was to go to the areas where, according to the old books, this fish could be found.

In 1983 and 1984, there were several unsuccessful attempts to organize this project. I applied for two visas during this time. Once I had to cancel my

plans because we couldn't arrange for transportation in Zaïre and the second trip was cancelled because I couldn't obtain the proper permission. Finally, in August of 1985, my friend Meir Levy (a new and ambitious Zaïre fish exporter, collector of famous Zairina paintings [school of Lubumbashi], and a real character) came to visit me in Germany. He agreed immediately to join our expedition to Bangui in the Central African Republic where we expected to find *N. dimidiatus*, according to Pellegrin. Back in Kinshasa, Meir began the necessary arrangements by buying a four-wheel-

drive vehicle and obtaining our visas for Republic of Congo, Cameroon, and the Central African Republic, as well as information about "non-existing" roads. Four months later when he called from Zaïre to tell me he was ready, I had given up. I was already on my way to collect rare discus in the Rio Branco region in Brazil.

At Christmas time, after my return, I heard that the Zaïre government had banned the export of live tropical fish for an indefinite length of time. Meir asked for me to come and talk to the *Department de l'Environnement Conservation de la Nature* and I promised to do so.

It was February when he finally secured all the arrangements again. Shortly before my departure, I telephoned Pierre Brichard in Bujumbura, Burundi, to confirm the supposed location of the fish. He was surprised by the long-distance call, especially since we



Top: I had to visit the *Departement de L'Environnement Conservation de la Nature* in Kinshasa for several days until I was able to get the fishing permit and to take out 50 live fish specimens. Above: the black water coming from the lake Kasuku entering the Lualaba river, upper Congo.



The only direct flight was from Brussels. I drove from Frankfurt through a foggy snowstorm, got stuck on the Autobahn in foot-and-a-half-deep snow, and missed the flight. Luckily I was able to return to Frankfurt and take a plane to Zurich, from where I connected into Kinshasa the next day. At the immigrations counter, I was surprised to see a beautiful Zairian girl carrying a large sign with *Heiko* written on it. She guided me smoothly past the mass of waiting people to an air-conditioned AMIZA (international forwarding) office. Here I waited while she quickly cleared my large amount of baggage, which included laboratory and camera

hadn't heard from or seen each other in ten years. He told me that the literature cites the incorrect location. Actually they had been collected in the virgin forest, in the creeks that flow into the Lualaba. He advised me to start the search at Kindu.

I wondered at this point if *N. dimidiatus* was indeed the fish described in the old books – or had Pierre discovered another fish? As the Telex lines to Zaire were broken down, I related the change to travel plans to Meir's kind wife, who was then in Brussels, Belgium. Meir must have thought I was nuts, changing our itinerary at the last minute! One must indeed be crazy to make such expeditions...



equipment. It was a relief; the last time it took me four hours to get through customs here.

While I waited, Meir arrived. He had already written a letter to the *Commissaire d'Etat* announcing my arrival. The next morning we went to see the minister, at the time, President Mobutu Sese Seko Kuku Ngbendu Wasa Banga's right hand. Mr. Kiwonge Luhandjula, the friendly minister, was dressed all in white and welcomed us warmly. Barely able to look over the

The friendly Minister Kiwonge Luhandjula (top) did advise his secretary to give us the permit to collect and export fishes, which did cost a lot. We flew with a chartered cargo plane, as no commercial flights exist to Kindu (centre). In Kindu we looked for a tailor to sew our fishing nets (left).



top of the papers on his mahogany desk, he said that it would be no problem to export live fishes again and that we should return that afternoon to get the permit from his secretary.

His secretary, however, was a bit stricter. He wanted us to produce proof we had a fish hatchery and agree to pay 3 zaire per fish exported (up from one zaire prior to the ban). The permit would only be good for a maximum of three months. We next contacted the person who was to prepare and authorize our papers. He followed Meir to the breeding ponds to gather information and take photos (he took at least 80!). Three days later – after endless waiting sessions at the ministry



(which happens only twice a year).

Flights to Kindu have been rare since an unfortunate incident in 1965 when two United Nations planes flew there on a peace mission and the 14 members crew was killed and cannibalized. I recalled the press headlines and was uneasy – but I figured it couldn't be worse than the time I was involved in a war between natives in Papua New Guinea (see *Tropical Fish Hobbyist*, March 1986) who were killing each other and where an arrow missed me by an inch...

At the Kinshasa Airport at 6:00 a.m. the next morning, we had to walk a mile and a half to the cargo plane hangar. On the way, we passed wrecks of old 707's and DC 8's. Finally,

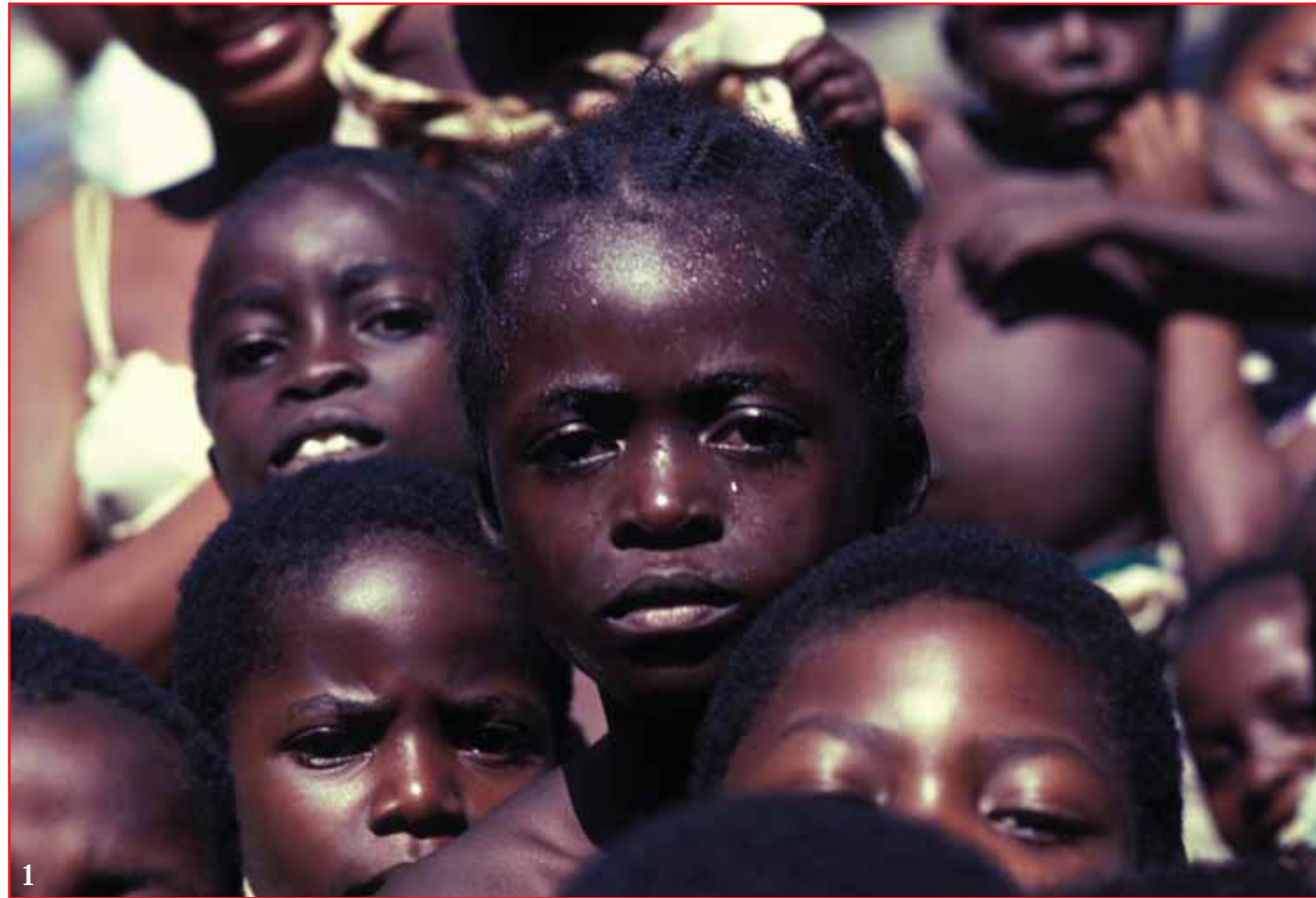
from 8 a.m. to 8 p.m. and one more raise of the export tax per fish (to 5 zaire) – the permit was finally issued. Then came the next problem: finding a flight to Kindu...

Air Zaire had cancelled its weekly flight. The other airline that shares this route flies only on Tuesdays (which wouldn't allow enough time). Our sole alternative was to contact businesses that charter flights to the interior. Luckily we found a Pakistani coffee exporter who had hired a cargo plane

The market women selling fish in Kindu did not want us to take their photos (top). But all the children wanted to have their picture taken (centre).

Every single fish caught is sold on the market. One portion (a plastic cup full) of dried tiny characoids is sold for less than 5€cents (right).





Children surrounded us everywhere we walked in Kindu, most of them had never seen a white man (1). On the market women offered us antelopes to eat (2). Carrying everything on their head is tradition throughout Africa, but not always with a finger up in their nose... (3). The most amazing hair fashion can be found in the remotest regions of Africa, also in Kindu (4). Monkeys, which we protect are eaten by the African natives, like this Central African Red Colobus *Piliocolobus foai* with deficient data for conservation. It will probably be extinct soon (5).



Formerly these monkeys had been collected and sold alive around the world, but since they are protected locals kill them to eat. Here Red Colobus *Piliocolobus tholloni* (6) listed on Appendix II (CITES). Also the Black-and-White Colobus monkey *Colobus guereza* on the IUCN Red list (7) but listed as Lower Risk.

thick jungles, rivers, and lakes all passed below us. For three hours we sat, with the doors rattling and the stench of the "toilet" (an ancient tub standing in the back) strong in the air. A few minutes before landing, we saw Lake Kasuku. It lay in the distance far to our right, surrounded by plains and jungle. There was no road visible.

At the landing strip stood a majestic air terminal, which had been built by Americans in the 1940's. It had never been used. We unloaded our gear from the plane and found a car in front of the

terminal. The driver agreed to take us to our destination. Just then, someone who claimed to be an official asked us for identification.

On a dirty scrap of paper the size of matchbook he wrote down information (our profession, the location, and duration of our visit) and when he asked for our permit to visit Kindu, we knew we had to produce money. The car, an old Datsun, was a wreck. The hood came off when the driver proudly lifted it to show us his new battery – the only fully functioning part. Despite

that, we had to push the car to get it started.

At the mission we were welcomed by one of the sisters. She had arranged all accommodations, including the rental of a brand new four-wheel-drive Land Cruiser and food for the outings. It was much more than we expected. Too bad the beginning of the trip had been so unpleasant! We accepted the sister's kindness and left right away for the outskirts of the village. The village lies on the left bank of the Lualaba River. In standing waters (infested with bilharzia) I saw some movement. I identified *Ctenopoma ashbysmithi*, an anabatoid similar to *C. nigropannosum*, the holotype collected by Banister and Bailey in 1974-75, but never seen alive before. In both standing and running water we found *Hemichromis* species – with vivid golden yellow bodies, light green fins, dark red-edged dorsal and upper tail fins, additional red lines in the dorsal, and red gill spots. Five large jet-black vertical ovals narrowed towards their upper bodies. Probably, a *Hemichromis fasciatus* form. Plant life consisted mainly of *Utricularia* species and swamp grass.

With "holes in our stomachs", we returned to the mission just in time for dinner, which was served at 7:15 p.m. sharp (only). After filling ourselves up with rice and green leaves (similar to spinach) we went for a stroll around town. Here, like in many other Zaïre towns, remains of the Belgian colonial settlements still stand. A formidable red brick prison, reminiscent of the Bastille, stood elevated in the centre of town. It was impressive! *Le Relais*, the only bar in town, played, out of a 1948-model Wurlitzer, Elvis' *Lonely Star* while we returned under a clear sky with the Southern Cross illuminating our way...

At 5:00 a.m. the next morning, we started off toward the only paved road, which began on the right bank of the Lualaba and went 36 miles east. We crossed over on a one-car ferry, overcrowded with native people who like the ride. The road on the other side leads to Kisangani and to Bakuwa (when negotiable...). Villages line the road. The huts are built with locally made bricks of red clay and palm-leaf



roofs. Cemeteries along the road are common – reminders of the dead on their way to eternal peace. We passed one burial ceremony; a newborn had died. The youth-mortality is incredibly high in Africa. Meir gave them money.

Soon I had my hand net, especially made with a super-strong polyester frame, and I waded up to the waist in the small, fast-flowing, red-clay-coloured Kanjanga Creek. A dark brown, narrow-banded *Microctenopoma nanum*, was brought ashore. Big ugly water bugs carried their eggs on their backs. The omnipresent African fish, *Hemichromis cf. fasciatus* abounded. Some boys stopped by on a bicycle, loaded with dead monkeys!

Human cannibalism supposedly stooped some five years ago here, but man continues to “cannibalize” apes and monkeys. The question remains: for how long? – There are hardly any left now. I ask myself; what are all these animal conservation programs good for when endangered species are being killed world wide? There are import and export bans in most countries now, but there is too little protection of animals in their natural habitats.

I am happy to be collecting fishes – of which many species are endangered too – mostly by man’s destruction of nature in endless deforestation and uncontrollable pollution – but at least they have a good chance to endure in our aquaria, breed, and (as a result) be around when the rivers and lakes are empty...

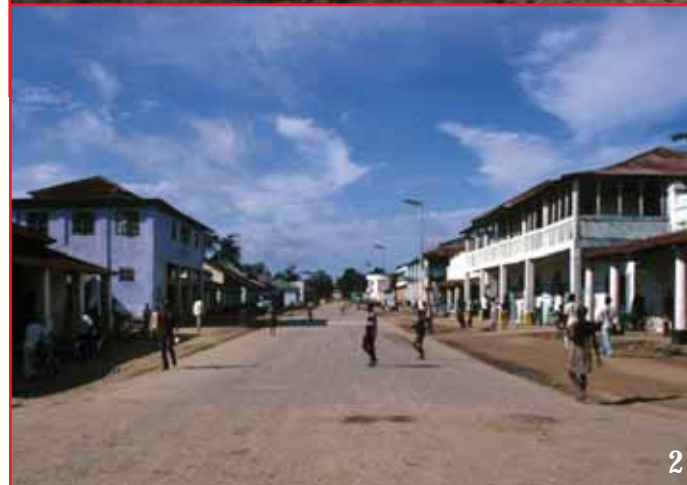
Seven more collections from the Katanga Creek and nearby areas this day until late that night produced quite

a few beautiful fishes. At least five different barbids: *Barbus cf. janssensi*, *Barbus cf. caudovittatus*, *Barbus lineomaculatus*, one totally unidentified species at Misabangu Creek, and almost everywhere *B. miolepis* in many different colours. One *Hylosopanchax sp.* And the zebra striped *Hypsopanchax zebra* were seen alive for the first time. Beautiful killies. Six different color forms of *Microctenopoma nanum* and *M. ansorgii*, and more (always loners): *M. fasciolatum* in striking blue colours and the larger *Ctenopoma ashbysmithi*.

We also collected two emerald green *Epiplatys* species – one with red dots, the other with black bands. The largest fishes we collected were found in the Elila River. The only concrete bridge built by the Belgians and still standing crosses this river. With my 100-foot net I seined an 8-inch *Tetraodon mbu*, a 14-inch *Schilbe mystus*, which had swallowed a small coconut (I never figured how it passed through its mouth!) and a 20-inch African tiger fish (*Hydrocynus goliath*). This vicious predator is widely distributed throughout the African continent and has teeth much sharper than a piranha.

Further, a water snake (non-poisonous), a giant *Mastacembelus* species, a *Brycinus sp.* (probably *B. nurse*) about a foot long and a *Synodontis* similar to *S. decorus* but less body-paint (only a magnificent black- and yellow-striped large lyretail) came into the net.

The current in the Elila was very strong and the muddy water very deep, and the millions of mosquitos didn’t contribute to making life easier...



2



3



4



5

With an almost brand new 4WD from the Diocese of Kindu, we drove south, on the only road built by the Belgians after WWII and came across a 5-meter-high termite house (1). The main street of Kindu (2). The only hospital in Kindu, called Centre de Sante Baraza Ya Afia Kasuku after the remote lake (3). We had to cross the Lualaba river with a ferry to reach the only road south (4). At a cross section there are still some old road signs, like to Kisangani 657 km, Bukavu 568 km etc., but such roads does not exist anymore, they are history (5).





1



2



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8



9



10



11



12

The railroad once linked Kiunga with Kalemie, Kamina and Kananga, but now stands still (1). We came by some native housing driving south direction Kasuku (2). Every creek we crossed I dipped my hand-net and searched for fishes (3). And in every village the people were very friendly and invited us to share the little they have (4-5). In some of the villages time has a stand still, it looked like they have not changed for centuries – and probably have not (6). In some creeks we collected young help came along, girls who wanted to catch fish as well (7). The natives live of the crop they grow and harvest it, protein is mostly supplied by what they hunt or fish (8). The unsurfaced road was getting worst the further south we drove (9). Than there was no more road and we had to cross what looked like a giant savanna all the way to the horizon. It is the only access to lake Kasuku (10-11). But it was mud below, soft underground and the 4WD got stuck – hopelessly. The more our missionary driver tried to get out, the deeper he sunk into the soft underground. It was hopeless. We had to spend the night in the middle of nowhere, without a chance to get out and without food... (12).

We found many new and rare fishes in our nets the last days we stayed but, not one *Nanochromis*. I was beginning to doubt their existence here, especially after reading Banister and Bailey's report of their 1974-75 collecting expedition in this area. They had found many fishes, but not a single *Nanochromis*!... and they had much more time! I fell asleep at 4 a.m. only to wake up at 5 a.m. to try Kasuku – the mystery lake!

The "road" leads first west and then south. Sabun Misanganano, the number one driver of the procure (mission), along with Tambue Ramazani and Lohahe Otschinga (his Warega co-pilots), told us it was impossible to reach Kasuku. Nobody lives there and it is surrounded by swamp. Soon we started to believe Sabun, because the road was *no* road anymore, just one mud hole after another and even the 4WD Toyota could hardly get through. It took 5 hours for the last 27 miles before the track definitely ended and we got stuck so deep in the morass that we gave up after 6 hours of painful digging. Meir made a fire out of wet logs the old-fashioned way: by rubbing a stick onto the wood!

Hungry (only four bananas for five men) dirty, in pain (from lifting the heavy Toyota so many times to get it out), and totally exhausted, we tried to rest late that night. Meir took the front seat (the "best" accommodation); Sabun, Tambue, and Lohahe wrapped themselves into the only rain-cover we had (supposedly to protect collected fish); leaving me with only my fishing nets as covers. But the millions of mosquitoes (and I never have seen or heard as many in all my expeditions) came right through it, as did the rain all night – a nightmare come true! With terribly swollen skin, cold and wet down to the underwear, I changed the water of my collected fishes alongside our stuck vehicle early the next morning. Sabun, who got up after me and realized what I had been through that night smiled all over his face ad sai (loudly), "*Jambo sana*" ("All the best this morning!"). He left with Lohahe to search for big logs to help free the truck.

Later, after we finally got the truck



Meir looked and was thinking “how can we get out of the mud?”(1). But the 4WD sunk in deeper (2) and once we managed to get out and drove (5) it was only for a few meters...

out of one hole only to get stuck 5 yards ahead again, we realized that there was no chance to reach the lake by car. But I hadn't come this far to give up. I packed my net and gear onto my shoulders and Meir joined me in walking approximately 10 miles across the swamp in the direction of Kasuku while our friends patiently continued to work on the liberation of the vehicle.

Walking barefoot among beautiful flowers, unusual plants and fruit, colourful mushrooms and dangerous spiny palm leaves, we finally reached water – about 3 hours later. But the lake itself was still not in sight. It had been flooded and was now inaccessible. Years earlier a native village must have existed nearby because we found some remains of a hut and ancient fishing gear. Also a rotting canoe. With a tree branch I tried my luck at “paddling”.



Meir didn't want to go on this risky excursion. Rowing over the treetops (for the first time I paddled on “top” of the jungle) in unbelievably peaceful surroundings, disturbed only by the splashing water, I finally saw Kasuku.

Like a hidden paradise, it unfolded in front of me. The water was smooth, black-tea-coloured, but still transparent. Because of the flood, I couldn't see any aquatic plants, but about 5½ miles wide and (I think) in the dry season, less than half that. Alone it was impossible to seine, so I just watched and enjoyed. Suddenly I heard Meir calling in the

We stayed over night and the next morning the helpers found some pieces of wood and while I changed the water of my fishes (3) the 4WD dug in deeper and deeper (4).

distance and I woke from my dream. Would I have to return without fishes? No, I just *knew* Kasuku had new and colourful species (I always found the most brilliant colours in “black waters” especially when very soft and with a low pH – Kasuku had 4.22) and that this painful trip wouldn't be in vain! Back

where Meir was waiting, I told him we must find a creek flowing into, our out, of the lake. A place, where we could seine.

Late that afternoon, hungry, (24 hours and only ¾ of a banana in my stomach) and exhausted, we reached the car. The vehicle was out of the mud – finally! I told Sabun to drive fast – if not we would sink into the morass again. Two more times we dug the 4WD and (after 30 hours) we finally had ground under the wheels again. Also the creek I was looking for came into sight: a tiny black-water, fast-flowing stream exiting



After I had changed the water of the fishes and the vehicle was still stuck in the mud, I took my fishing net and walked the remaining 10 miles or so to the lake Kasuku. It was a fantastic walk through untouched nature, with unknown seeds (1), unusual flowers (2+9), crossing trails of ants (3), black water creeks (4) full with butterflies (5) and spiny leaves (6), mushrooms on the bark of trees (7), orchids (8) and much more.

Kasuku. All the hunger and the pain, the mosquitoes and heat were forgotten as we dipped our hand nets and came up with the most colourful *Nanochromis*. As a matter of a fact, Meir yelled “*dimidiatus!*” because he caught one just before I did. But I knew right away it couldn't be, because this fish was much more colourful than the one described.

It wasn't the fish Pierre had exported and it was very strange because Banister and Bailey had not found this species on their field trip in 1974-75.

I was positive we had found a new *Nanochromis* species. This fish had a

magnificent red head, the same colour covering most of the rest of its body as well, except for its mid-section which was entirely silver covered 12 scales (about of its body). An even more distinct silver spot was just behind the anal fin, a strong red in the upper tail, and a large black spot is near the end of its dorsal fin. These are the “trade marks” of this jewel. The dorsal fin also contained black spots near the top and was silver in the centre. We also collected four specimens of the most magnificent *Barbus papilio* – ever seen alive before.

After endless difficulty in making our way out of Kindu, two days later we found a missionary offering to fly us to Kisangani for \$1000 per hours. But that wasn't the only problem: hundreds of people making life miserable by asking for a tip, three hours spent in Kindu prison because we photographed an old building, and waiting and begging everywhere until we reached Kinshasa three days later.

Since then, this new *Nanochromis* has been bred successfully and these unique beauties are available.

But the search for the mysterious *Nanochromis dimidiatus* continues...



When I finally reached lake Kasuku it was flooded. No one lives there (or has ever lived), fortunately someone had left a dugout behind which came handy for me to do research, but being alone (Meir had returned) I was unable to do much collecting. I was lucky along the edges, in water depth of one meter or less to find among submerged terrestrial vegetation (above) some fishes (see below and next page). Also a very nice Central African puffer *Tetraodon miurus*.



But the highlight of my collecting in the Kasuku region was the amazing *Nanochromis* (2) I discovered already in the 1980s. It was described by Anton Lamboj in 2005, named after his daughter *sabinae*. And two years later four species of *Nanochromis* were placed in the new genus *Congochromis* Stiassny & Schlieven 2007 including this one. But I believe there is a big difference between the described one from Gabon and this one here from the upper Congo (the Lualaba and Kasuku) region. The lower two (3-4) are also female specimens, which I collected near Kisangani and they might belong to the recently described *C. pugnatus*.



(In this tiny creek on the way to Kasuku (probably another outflow of the lake Kasuku, like the one on the first double page of this article – the black water entering the Lualaba River and flowing along with its black colour), I collected the fantastic *Barbus papilio* (1-2) one of the smallest and never caught before beauty. The males have a jet black dorsal, pectoral and anal fins. The three also jet black spots turn, mainly in males, into a stripe along its side.



I collected also this puffer, another beauty, the *Tetraodon mbu*, in this creek (3) and as we took it out of my net it blew up its belly, its typical defense mechanism. But the later has a wide distribution pattern throughout most of the central African countries and is even found in Lake Tanganyika. The other fish in the net, *Papycranus congoensis* (4), is only known from the lower Congo and I was able to collect it here as well in the Lualaba region, the upper Congo, from where no one has it recorded. It is a peaceful but active night dweller and a so-called knife fish with a beautiful colour pattern – very unusual and quite rare.



Some of the habitats in nature are quite different from what we think. Here a typical environment of *Synodontis soloni* (1) dwelling between rocks. They swim deep into the cracks to eat from the Aufwuchs (2). In aquaria therefore they should also have rocks and if possible covered with moss or Aufwuchs (3). In nature, at the habitat, there were so many when I collected them that one person who was helping me holding up the plastic bag stepped right into one. The density in the river (4) was amazing. This beautiful cichlid, *Tilapia congica* (5), lived also in this habitat and was in my net. Normally this cichlid does not have such a bright colour (or better: it is know to be not very colourful), but it might be just another population than the one originally described from the Kasai River in the Equatorial Congo region.



The population of the Congo comprises approximately 200 ethnic groups, the great majority of whom speak one of the Bantu languages. In addition, there are Nilotic speakers in the north near Sudan and scattered groups of Pygmies (especially in the Ituri Forest in the northeast). The principal Bantu-speaking ethnic groups are the Kongo, Mongo, Luba, Bwaka, Kwango, Lulua, Lunda, and Kasai. The Alur are the main Nilotic speakers. In the 1990s, Congo also had an influx of immigrants, particularly refugees from neighboring countries. In 1985 over half the population was rural, but the country is becoming increasingly urbanized, although I was able to find still quite a few ethnic groups which follow their ancient traditions and cultures.

Although French is the Congo's official language, it is spoken by relatively few persons (as mentioned above). Swahili is widely used in the east, and Lingala is spoken in the west; Tshilaba is also quite common. Many of the people living specially in the eastern (oriental) region follow traditional religious beliefs, and about 10% are Muslims. In the Democratic Republic of the Congo today about 50% of the inhabitants are Roman Catholics and 20% are Protestants. A substantial number are adherents of Kimbanguism, an indigenous Christian church.





Below the cataracts of Kananga (1), in the habitat shown in the foreground, lives a beautiful dwarf cichlid, *Steatocranus rouxi*, which I was able to collect for the first time a live. Like all of the other *Steatocranus* species, it lives over rocky ground sometimes mixed with sand. Also among roots and driftwood, rarely with aquatic vegetation. Here they dwelled, among Podostomaceae and mosses. *Steatocranus* are mostly rheophil cichlids hardly reaching more than 10 cm in TL, most of the species remain much smaller and all are bottom dwellers with a reduced swim bladder. They all show a relative greyish, some yellowish or bluish colour pattern and are quite well camouflaged in nature. In the aquarium they become very active, are beautiful and interesting creatures, which need some rocky caves and places to hide, as that is their nature. Eight of the nine species described are found in the Congo River basin, only *S. irvinei* (not shown) is known from the upper Volta River basin in Ghana. The most common in the hobby, is *Steatocranus casuarius* (not shown), which is readily available. In the last years also *S. glaber* (3) and *S. rouxi* (4) from breeding (here F1 in aquaria). The species *S. mpozoensis* (5), *S. bleheri* (6), which I also discovered in the upper Congo many years ago, less frequently, also rarely *S. ubanguiensis* (7).



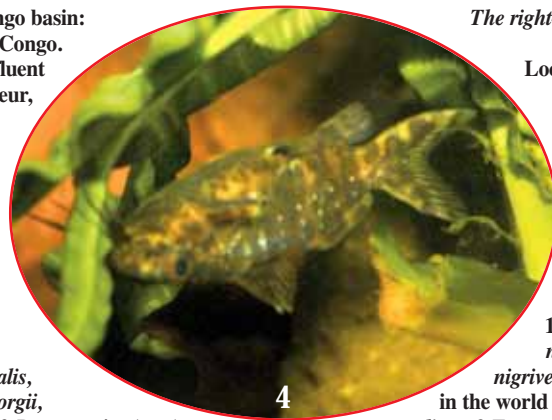
Here some more dwarf cichlids for the home aquarium also from the Congo basin in Central Africa. They belong to the genera *Orthochromis* (2), *Nanochromis* (3-6) and *Lamprologus* (7). These beauties, which are also ideal for smaller aquariums, are peaceful mostly bottom dwelling cichlids with amazing behaviours, each one unique in itself like *Orthochromis torrenticola* (2), which I found only in the habitat above the Lufira waterfall (1). It is different from the other 13 described *Orthochromis* species by its shape being elongated as *Schwetzoichromis* (in the genus it was formerly placed), the eye-spots in the anal fins and living only in the habitat shown. *Nanochromis transvestitus* (3-4) was named in honour to the extreme beautiful colours in the female (3) vs. the male colour (4) and I collected also the first live specimens. *Nanochromis parilus*, here a pair (5), reaches rarely 6 cm in TL, and *N. splendens*, here a beautiful female (6), grows to max. 7cm TL. I often call *Nanochromis* (and now the species placed in *Congochromis*) the African *Apistogramma*... There are 6 riverine *Lamprologus* species from the Congo basin known, but almost exclusively *L. congoensis* (7) can be found in the hobby. Here a male in full colour. The aquarium decorations shown are those found in nature of these species.



Two Biotope aquarium decorations from the Congo basin:  
 This page: Rivieré Ubangi largest affluent of the Congo.  
 Locality: the habitat represents a black water affluent of the upper Ubangi River in the province Equateur, of the Republic of the Congo, former Zaire.  
 The aquarium (1) contains 600 l and has the following fish living in such a biotope sympatric (some are shown here):

- 8 *Distichodus sexfasciatus* semi-adult (2),
- 7 *Hemichromis* sp. "Ubangi" (4), 20 *Synodontis nigriventris* (4), 3 *Synodontis atterinus*,
- 3 *Synodontis robertsi*, 2 *Synodontis acanthomias*,
- 3 *Synodontis nummifer*, 3 *Synodontis greshoffi*,
- 6 *Synodontis contractus*, 3 *Synodontis notatus*,
- 2 *Synodontis pleuropis*, 30 *Phenacogrammus caudalis*,
- 20 *Rhabdalestes septentrionalis*, 6 *Ctenopoma ansorgii*,
- 12 *Gnathonemus boulengeri*, 2 *Phago maculatus*, 2 *Pago* species (new),
- 3 *Eugantichthys eetveldii*, 5 *Tetraodon miurus*.

The decoration you see here is according to the natural habitat: stones and small gravel (2) and slightly larger gravel (3). Some driftwood can be found (is in the rear) and trees hanging over (and into the water, when the water rises). It needs different sizes of gravel for this habitat, rarely sand, because like the *Distichodus* need larger gravel, *S. pleuropis* even little larger gravel to be able to take it into the mouth to carry it (they built nests). The dwarf cichlids need small gravel to dig into it in search for foods. The aquatic vegetation consists of mainly ferns, *Bulbitis heudelotii* growing partly submers, but often along the edges. Also sometimes different *Crinum* species, like *C. calamistratum* and *C. natans*, are found in this biotope and these grow only under water. There should be a good biological filter and slight flow in the tank.



The right-hand page is a second aquarium biotope from the Congo region.

Locality: a black water affluent of the Lualaba in the vicinity of Kisangani (former Stanleyville). This aquarium has 450 l and the following fish (and density) lives in such an almost authentic habitat (and some shown):

- 6 *Briconaethiops boulengeri*, 6 *Distichodos noboli* small, 6 *Distichodus affinis* (mimicry, but the latter grows much larger), 20 *Phenacogrammus caudomaculatus* (7), 6 *Phenacogrammus breuseghemi*, 25 *Phenacogrammus interruptus*,
- 12 *Phenacogrammus cf. smykalai* (6), 6 *Xenomystus nigri*, 8 *Microctenopoma fasciolatum*, 12 *Synodontis nigriventris*, the upside down catfish (there are only two in the world swimming all the time head down...), 4 *Synodontis angelicus*, 3 *Tetraodon mbu*, semi-adult (10). And note: the mentioned fish species should not be kept in smaller groups (or single ones) than those placed here in the biotope aquarium.

The decoration consists of very fine gravel (1-3 mm max.), lava stone, rarely rocks, and of driftwood, as well as roots (water them well before placing in the aquarium – at least one week, more is better).

The vegetation consists of some ferns, *Bulbitis heudelotii*, some *Anubias barteri*, *A. nana*, *Cyperus alternifolius* and *Nymphaea* (the latter two grow also out of the water and can survive in the dry).

The chemical water parameters on those habitats were:  
 For the Ubangi biotope (in nature): pH 5.6-6.7; conductivity 29-35  $\mu\text{S}/\text{cm}$  and the temperatures from 26.5° up to 31.5°C.  
 And for the Kisangani biotope: pH 5.4-6.2; conductivity 22-48  $\mu\text{S}/\text{cm}$  and the temperatures from 24° up to 30°C.



# Rio Iriri

There are actually on the planet earth still rivers over 1,000 the kilometres long and completely unexplored – at least ichthyologic-wise. And (naturally) Heiko Bleher had again to be the first researchers to enter this remote Paradise for the science and the Aquarist.

Text and Fotos by Heiko Bleher & Natasha Khardina



The Rio Iriri is the largest affluent of the large, for aquarists well known, Rio Xingú. It merges from its left some 80 kilometres south of Altamira and has approximately half its length (the Xingú is 2,045 kilometres long) but is much broader. The Xingú was already visited and sampled as early as 1842 from the prince of Prussia Heinrich William Adalbert (1811-1873), as well later in its lower region by the world-well-known Thayer-Expedition (1865-66) under the direction of Jean Louis Rodolphe Agassiz, and by the German Karl von Steinen (1855-1929) in 1884, and many more naturalists researched the Xingú in the 20th Century, but none of those ventured the Iriri. And I asked myself often „why?“ but once I had decided to go, I found out “why”...

My friend Haroldo in Altamira, was not astonished, when I on my most recent visit to Altamira I told him that this time my goal was of the Iriri. He explained that no one ever collected fish above the enormous current and cataract, the only *casquados* (catfishes of the family Loricariidae) caught in recent years were below. No one dares the upper Iriri: “É difícil demais” (it is to difficult) he said and added that he knows of fishermen who collect in the lower Iriri the so-called L-18 loricariid. Unfortunately in popular literature the type locality is confounded with the one found in the Xingú and in the lower Iriri two species of *Baryancistrus* can be found which are very similar. One has a larger gold-yellow dotting and it occurs also in the Rio Xingú in the rock and stone regions south of Altamira, which is L-18 and L-177 (some one has given two separate number for the same species). The second species found in the lower Iriri and only there, has also a broad gold-yellow seam in the in the dorsal and in the edge of its tail fin, but the golden points are substantially smaller and over the whole body distributed: *Baryancistrus* sp. 2 ‘Iriri’. And this species has similarity with as L-26 listed as *Baryancistrus* from the Rio Tocantins – where I was unable to find it (see photos).

With Chico, the only *practico* (experienced boats man) who knows every



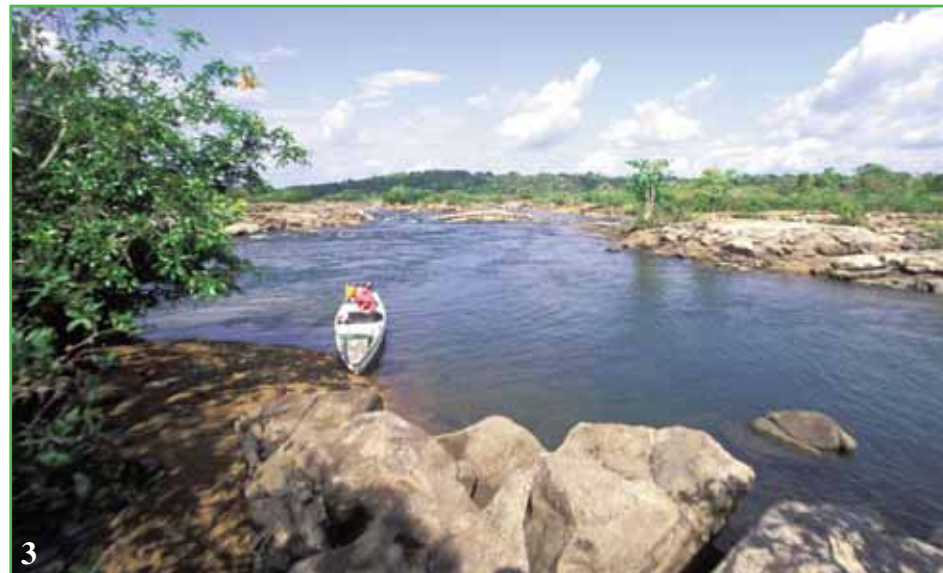
rock and the dangerous current in the middle and upper Xingú, we drove in Haroldo's Pickup to the gas station and filled 600 litres of fuel into different containers, which I was able even to pay with a credit card...

Natasha, my better half, bought on the market fruits as well as the most necessary items for our journey and we loaded the *voadeira* – the aluminium boat which was to take us up the Xingú into the Iriri. Including the cameras, fish tanks and catch devices. Chico carried itself 10 Kilos of *farinha* (manioc flour), the nutrition or better daily "bread" of every *caboclos*. But the fuel was our heaviest load and Haroldo said: „*Com isto tudo vocês não vão nunca subir as cachoeiras*” when Natasha, Chico and I left the port of Altamira. He meant we would never come with this weight over the waterfalls ...

After five hours up river passing along rock and black stone massifs on the left and on the right rising out of the water (it was dry period) Chico turned the *voadeira* into the Iriri delta. I asked myself, how one of the immense cattle farms on the left and on the right along the Xingú up to this delta, removed their thousands of cattle across these giant rock formations, because here are no more roads.

The Iriri is hardly 100 meters wide at its delta and continues to become ever more narrow further upriver. Only a few kilometres into the Iriri I did ask Chico to stop and we made the first discovery. I saw between the stones in quite clear water *Leporinus maculatus* and *L. fasciatus* var., the same species found in the Xingú, likewise the characoids *Moenkhausia dichroua* and *Brycon pesu*. But together with the latter were two more *Brycon* species: one had a transparent adipose fin (vs. jet black in *B. pesu*) and a black edged tail fin design (the vs. transparent in *B. pesu*). Both had similar size of, about 7-10 cm overall length, a silver body, a

It was tough and although Haroldo's said that we would not make it with Chico's and Natasha's help we succeeded. First dragging the *voadeira* with the equipment (1-2) and finally unloading all material and carrying it and the *voadeira* over the waterfall. Finally "on top" in the Iriri river above the fall, we anchored (3) the *voadeira* and rested, before a worse adventure was to come...



black humeral spot and a light blue shining eye. The third in the group was slightly larger and was *Brycon amazonicus*, also with a humeral spot and a black edged caudal. (However the latter grows over 40 cm long, while the other two exceed rarely over 10 cm in total length.) The question is: why this mimicry? Who profits from whom? Because none of the three is a predator...

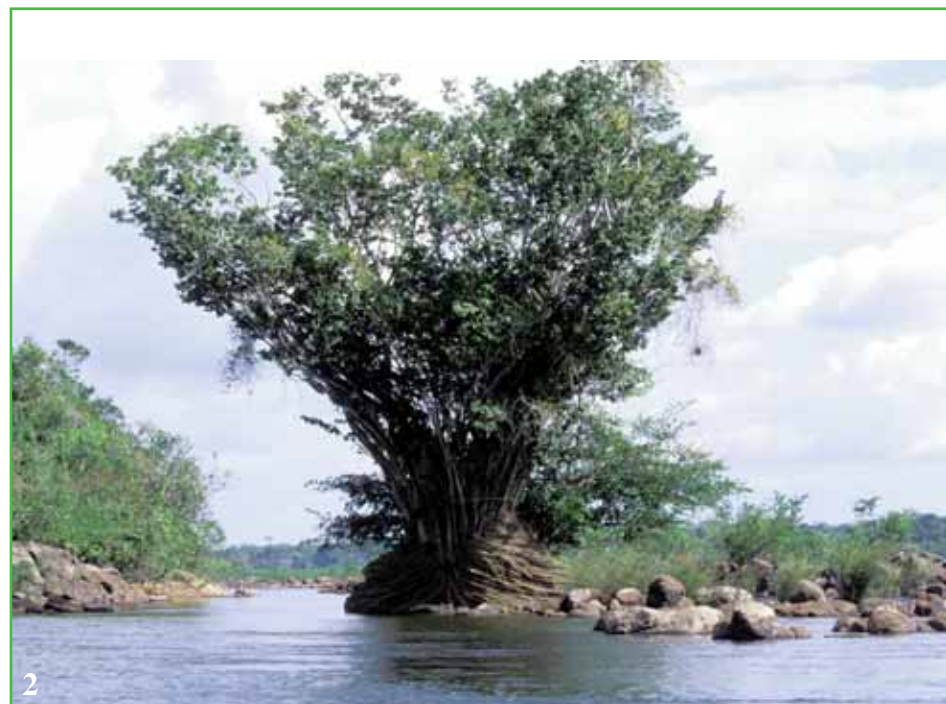
But that was not everything: *Hemiodus quadrimaculatus* (never recorded before from the Iriri) was associated under a group of *Leporinus maculatus* (both have three bars) – was this also mimicry? I continued diving in this clear habitat and I saw in the stone niches *Panaque* cf. *nigrolineatus* (*P. sp.* 1 'Iriri') moving up and down next to a dotted *Leporinus* species scraping on the rocks while small group of young *Crenicichla* (*C. sp.* 'Xingú' II), with their juvenile banded pattern were swimming together with *Cichla temensis* (also a banded cichlid) over the sandy bottom in search for food.

Further up river we had to pass very dangerous rock massifs, with passages of only a few meters in width, and than spotted a sandy area on the left bank. Here Natasha pulled the 13-meter-seine with me and we caught two wonderful large *Retroculus xinguensis* (later, above the waterfall we should find two new *Retroculus* species) and a number of light-coloured *Corydoras*, possibly *C. xinguensis*. And we had another interesting fish in the seine: a bottom dwelling *Bivibranchia* species with a protractile mouth, which it can extend extreme long (see photo). At the same time Chico had already two large *tucunarés* (*Cichla* sp.) on a hook and our evening diner had been secured. Shortly after that it became pitch dark and we stopped just below the very large Cachoeira and opened up our tent open on a mosquitoes invested river island. The beasts sucked our blood while we tried to eat the delicious *tucunarés*

It seems to be unbelievable that in such a beautiful place, a unique river with amazing scenery (4) no one lives. In Europe or North America, in Asia or elsewhere, high risers would edge these shores. We put up exhausted our tent on one of the islands with a river view (5) and slept in surrounded by such a peace city-people can only dream of...



1



2



3

The upper Iri River is in some parts several km wide and looks like a huge lake (1). And in the one-tree-island in the far end (2), below its gigantic roots I made a sensational discovery (see right-side page). We angled our own eating fish every day. One catch was *Prochilodus nigricans* (3), which may reach 50 cm TL. While we grilled it over the open fire (4) millions of may flies, perhaps *Tortopus harrisi*, covered the waters of the Iri (5) and gave food to most of its fishes (5), but also our grilled fish...

Chico had grilled over the open fire... When I woke up next morning at six o'clock I walked to the cataract and looked up to its high of a two story building and its approximately hundred meters length, I tried to think how to get over it. Ones Chico got up we had a strong breakfast with oranges, tea, pumpernickel bread and honey, Chico had his *farinha* and coffee. Right after it we began to unload the *voadeira* in order to drag it empty over the rocks and lift it above the water falls. But first we carried all our equipment and the fuel containers up on top of the



4



5

cataract. It was nearly noon when we had finally finished and started to get the *voadeira* also to the top. I pulled and Chico went in the back pushing it over the Cachoeira. Fortunately it was a stable aluminium boat and we got even assistance of four *caboclos*, which had arrived and were also on their way to the Iri to catch *tucumarés* – which obviously live in large numbers in the untouched river portion above the falls. They fetch a very good price on the Al-tamira market for this delicatessy. It became a joint venture, only that

their large wooden fishing boat was much heavier than our *voadeira*. While trying to get these boats to the top I began to understand why never a white man has researched above these cataracts. In addition to this task mosquitoes bite the hell out of us. Late that afternoon began take two. It should become still worse. After we had reloaded everything we moved forward surrounded by close primary forest – no human sign anywhere, no one lived here, let alone ever lived. The upper Iri is here 30 to 50 meters wide and the water highly transparent. I saw a couple of *Aequidens* guarding their babies along the stony edge and deeper over e nest a pair of *Retroculus*, likewise taking care of their brood. Groups



6



7

Between the cracks of the massive rocks in the Iri (6) I discovered a fascinating new *Moenkhausia*, which can grow to 7 cm and more. It was later named in my honour *M. heikoi*. The species lives with some syntopic species in strong current between such rocks, at depths of up to 2.5 mm. In the aquarium one adult male reached 8 cm in TL (7). The first juvenile *Moenkhausia heikoi* (8) I captured in the Rio Iri among submerged roots (photo 3, left-hand page) was not living as deep as the adults.



8

of *Leporinus* were gracing over the round stones covered with Aufwuchs and in the open water I spotted a large swarm of possibly *Brycon amazonicus*. Along the very shallow bank below overhanging trees and bushes among thousands of leaf dwarf cichlids, *Apistogramma* and *Crenicichla* as well as smaller characoids of the genus *Bryconops*, *Moenkhausia*, *Astyanax* and *Hemigrammus* were having a good time. Loricariids everywhere in the middle over the rock-covered ground. I was able to classify some un-described species (see photos) in no time. This discovery was however the peace before the storm.

We had to manoeuvre the *voadeira* across a narrow passage against a very strong curreant. Here this river forms a kind of funnel before its waters tumble down the cataracts. It looks like this was once a huge lake on a plateau, which during evolution started to break across large rock massifs for several kilometres to finally drain out into the lower Xingú. Our outboard motor was unable to cope with the curreant the *voadeira* bumped left and right against the rocks. We jumped into the water. I began with the left had pull the boat on a rope and with the right had hold on to the rocks pulling forward against the tremendous strong curreant with Chico in the back pushing with his head most of the time under water, whereby he slipped away again and again as I. Natasha as she realized that we were



The Iriri has many rapids and lower waterfalls and always in the strongest part of the fall one specialized aquatic plant family can be found – almost circumtropical – Podostemaceae or riverweed (1). It has the unusual association between root branching and root-borne adventitious and during evolution adapted from subcylindrical or ribbon-like roots to foliose roots. About 50 genera and 250 species are known. During the

fighting a lost battle, she jumped also into the water to help Chico in the back. But suddenly she was carried away by the water force and down river got stuck with her left leg between some rock massifs. While I climbed ashore hold the *voadeira*, Chico dived back underwater to liberate Natasha before she drowned. The fight seemed offering no prospects. I tied up the boat and ran over the rocks to search for another channel an alternative break through. The region was full of rocky islands and finally, after hours of fight again this tremendous water power we

reached at dawn, more dead than alive, this giant lake-like plateau. Here the Iriri was several kilometres wide and really gigantic with sand-islands. Not even the Xingú above Altamira has any place like this and it is no wonder these masses of water have to find a way out. With blue marks we fell into our tent on an island and deep asleep without any diner. But we had survived it and on the next day paradise should open up in front of us.

Macaws woke us up in the morning and Tukanos flew in pairs over our heads. The fog slowly lifted and the

sun started to break through over the crystal clear river bed. A few *Hemiodus* jumped over the water surface as if they wanted to say „bom dia” (good morning). I saw on the sand-island the dried up nests of *Retroculus* and *Geophagus* species. The nests are amazing. After they have dug a wide hole into the sand, they carry large amounts of heavy stones into it, pieces of driftwood and leaves before they start to lay their eggs.

After the breakfast I sat on the brow of the *voadeira* and steered Chico around the enormous rocks in the water. Here up-river the Iriri was very slowly flowing and one could see everything in this transparent water, every single scattered stone nearly without exception. Suddenly seven freshwater stingrays appeared below the boat, with one leading animal, followed by the other six. Something similar I remembered from the island

Batanta (Indonesia) with marine stingrays, also guided by one alpha animal, only the group there was much larger and it seemed as they were floating... It look like *Potamotrygon scobina* and *P. motoro*, but this could only be an estimate, however underwater pageant should become still many more exciting, because I could hardly trust my eyes shortly thereafter. The entire stony underground became scattered by black loricariids. I found out later that it was a *Baryancistrus* species which I designated *B. sp. 1* 'Iriri'. They moved over the whole river width to hundred thousands (millions), river up. It had to believe this was a gigantic migration, which we could pursue over many kilometres. Most of them were animals of 15-25 cm in total length and also this reminded me of a similar encounter years earlier. It was at the begin of the dry season in 1997 in the region of Mamirauá, where I was lucky enough to assist a siluriform migration of all 10 known catfish families from the Amazon basin. I estimated that those were over two billion catfishes migrating to a gigantic spawning ground (see Bleher's Discus, Volume 1, pages 456-457) and also while I was diving in the re-seeding water in July of 1975 in an

Tapajós affluent, I assisted a *Rineloricaria* migration that spread the entire 25 meters of the river bed and in four layers, one above the other moving up river. This here looked very similar...

At a small island in the middle in the river, with a high *Ficus* tree and its large thin roots growing underwater, I asked Chico to stop. I tied up the boat in the current and dove with my hand-net deep under the root inside to come. I had a young black *Crenicichla*, a striped *Laemolyta* and a dotted *Leporinus* in the net, and a small black characoid with a golden stripe and golden eye (the upper half). The latter was of the same species which in 1975 during my first Transamazonica expedition searching in the lower Xingú I discovered in the strong current below rocks and again 1999 also below the mouth of the Iriri delta, again under rock formations in the current. Does this species occur only in the Iriri and its eggs are carried down river? I should find the answer to it later. (In the meantime I am sure of it.)

The fish biomass here in the Iriri was simply overwhelming. We did not come out from being astonished and caught like the world champions nearly one week long at 15 further places of approximately 600 kilometres river on, in a paradise hardly found anywhere else on planet earth. Completely uninhabited except for a single *caboclo* family, which we found on the right bank a couple of days late, but the night before that I had however a very strange experience. We camped again on a river island, right on a wonderful sand bank between large rock formations. The beach must have emerged just a day or so ago, many places were still wet. The roots of the trees on the beach looked like in a ghost movie, hanging around in the air, the strong current had washed them out. And while I was walking along the banks looking, as always, at night for fish, innumerable jumped far out of the water often 2-3 meters up and away to dive back in. Obvious night-active predators (mostly large catfishes of the family Pimelodidae) were here at work because of the dryness's, which makes food sources



dry season they live a terrestrial existence for a very short time and flower (2) before they die off and only the roots remain until the water rises again (see also first double page). On the other hand also beautiful flowering bushes grow in its rapids, some with bright yellow (3) and others with violet flowers (4). Those thrive all year long, some time submerged, with very strong roots and supply food to many fish species.

scare. And it is too nearly hard to believe the night-jump a fish can make to save its skin... During the day I had already such an experience with a large *Retroculus*. Sitting in my photo tank and as I began taking pictures he jumped out of this tiny aquarium almost one meter high into the air into a nearby sand hole, with approximately 20 centimetres of depth. When I ran after it and wanted to grab it in the hole, he made another enormous jump, more than 1.5 meter distance directly into the river bed. Gone, a beautiful specimen. The following larger cichlids I only

photographed them holding it in my hand. These cichlids have a reduced swimming bladder and therefore predominantly live near the ground regions, but can nevertheless can jump tremendously and make easy a *Salto Mortale* ...

The jumping did not diminish, also not as I was back in the tent to sleep. I had a weird dream that night about a gigantic earth worm: the giant sand worm from a Hollywood film, which comes only out if it is hungry and then devours humans. I woke up as the sand under the tent moved... I struck the



In some parts of Iriri's stony river bed was covered with catfishes, hundreds of thousands of these loricariids which all belong to the genus *Bariancistrus*: 1. *Bariancistrus* sp. II "Iriri" adult; 2. *B. sp. II* "Iriri" semi-adult; 3. *B. sp. II* "Iriri" juvenile. 4-5. Two juveniles (different ages) of *Bariancistrus* sp. III "Iriri" (also called L-177). 6. A semi-adult of *B. sp. III* "Iriri". But there was also one *Bariancistrus* with real orange spots and edged fins, a real beauty, never seen before. We must wait and see what it will be, for the moment called *B. sp. IV* "Iriri".

But besides *Bariancistrus* there were several other genera represented, also some new. Their identification is only possible correctly by their mouth and teeth formation (8-10): 8. Mouth of *Bariancistrus* sp. III "Iriri" (L-177). 9. Mouth of *B. sp. II* "Iriri". 10.+11. *Oligancistrus* sp. I "Iriri" adult. 12. *Oligancistrus* sp. II "Iriri" (also called L-20) adult. 13. *Pseudacanthicus* sp. I "Iriri" semi-adult. 14. *Parancistrus* sp. I "Iriri" adult. 15. *Scobiancistrus* sp. I "Iriri" adult. 16. *Panaque* sp. I - cf. *nigrolineatus* "Iriri", semi-adult. One can see, many of the subfamily Ancistrinae are represented in the Iriri.

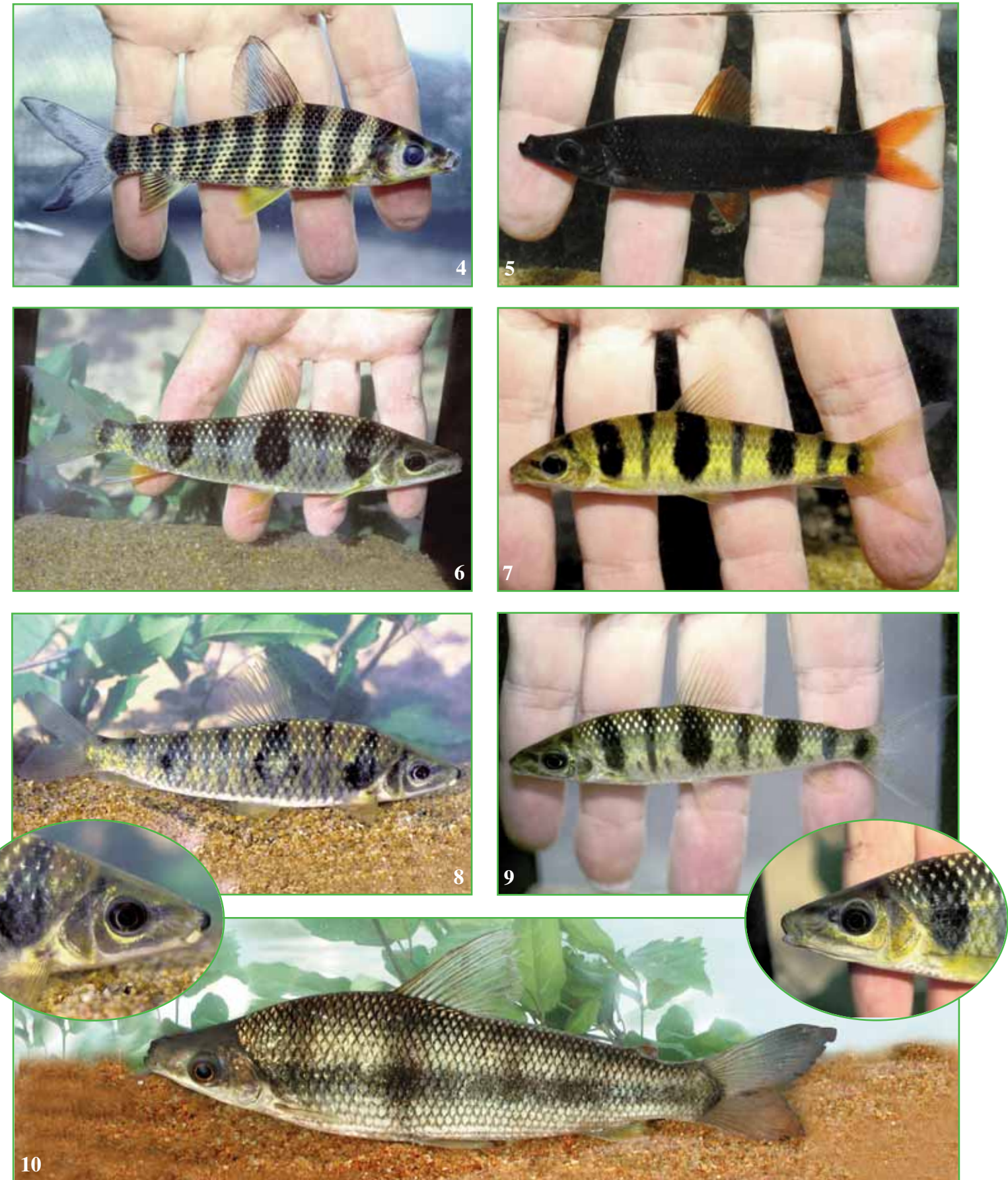


The variety of loricariids is breathtaking in this river, here some more: 1. *Pseudancistrus* sp. "Iriri". 2. *Leporacanthicus* cf. *heterodon*. 3. *Squaliforma* cf. *emarginata*. But also other catfishes are here abundant, like: 4-5. *Ageneiosus* cf. *brevifilis*. Note the male with its reproductive organ in the dorsal fin (4) and the female attacked by Piranhas and eaten up in its rear, typical for the dry season. 6-8. Three new *Corydoras*, of which 2 are classified in Germany as C21 (6) and C87 (7) while the third (8) was never seen before (I named them sp. 1; sp. 2; sp. 3 "Iriri" respectively). 9. One of the pimelodids or heptapterid could belong to the genus *Mastiglanis*. It lives only over sandy ground. 10. And also one of the several candirus I found only over sandy ground was my *Trichomycterus* sp. 1.





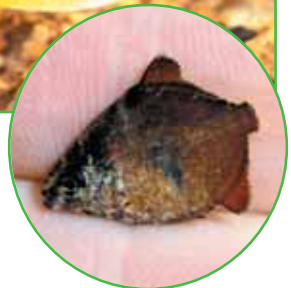
One might think loricariids dominate the Iriri, but this is only in biomass, in species the characoids dominate and here are few of the larger ones, from the family Anostomidae (on both pages and on page 42). The above 3 species (probably all new) live sympatric, that is they live in mimicry and can only be distinguished once one has a very close look (therefore incerts of the head-pattern): 1. *Leporinus* sp. III "Iriri" adult. 2. *Leporinus* sp. II "Iriri" adult. 3. *Leporinus* sp. I "Iriri" aff. *megalepis* approximately 80 mm TL. The latter has the brightest red coloured fins and is the smallest of the three.



4. *Leporinus* sp. III "Iriri", adult (this one is being described and lives in mimicry of *Leporinus fasciatus*, but it has on each scale a black spot. 5. *Anostomus cf. intermedius*, adult. 6. *Leporinus maculatus* "Iriri", adult. 7. *Leporinus maculatus* "Iriri", juvenile (much brighter in colour). 8. *Leporinus* sp. aff. *maculatus* "Iriri", adult (new species living in total mimicry with *L. maculatus* – see head difference also). 9. *Leporinus maculatus* "Xingú", juvenile. 10. *Laemolyta petiti* "Iriri", adult. The latter can reach almost 30 cm in TL.



Some more rare anostomids found in the Iriri. All of these live in the fast flowing water areas and have adapted through evolution to a unique feeding behaviour standing head down and scraping from the rocks the Aufwuchs, algae and microorganisms. They can even scrape food out of cracks in the rocks were other fishes cannot reach into: 1. *Sartor respectus* and see its unbelievable teeth (2). 3+5. The second *Sartor* species I found is probably new, a light coloured *Sartor*, never seen before. So far from this genus only 2 species have been described from South America. 4+6. The most colourful in the group is the monotypic *Sinaptolemus cingulatus*. It is a fantastic species and has a wide distribution in South America, but is very rare to find.



The characoid family Serrasalminae is also well represented, like with: 1. *Tometes* sp. (Myleinae A), semi-adult. 2. *Myleus* sp. (Myleinae B) adult female. 3. *Myleus* sp. (Myleinae C) semi-adult, from near mouth of Rio Iriri, the caboclos call them pacu manteiga. 4. *Myleus* sp. (Myleinae D) "torquatus group", adult. 5. *Myleus* sp. (Myleinae C), juvenile of pacu manteiga. 6. *Myleus* cf. *schomburgkii*, semi-adult (insert to the right, baby of *Myleus* cf. *schomburgkii*).



1. At least 3 species of *Cichla* occur in the Iriri. Here Chico with a fresh caught *C. cf. temensis*. 2. I was able to catch a very large *Serrasalmus humeralis* of 42 cm in TL (some consider the latter a synonym, but Géry classified it as a good species). 3-4. There are 2 forms of *Serrasalmus rhombus* in the Iriri. Both have a red eye, but one is a schooling fish and has dark spots (3) and the other one live individually, is silver and no spots (4). 5. *Serrasalmus cf. elongata*, juvenile. 6. And I had to include this picture of a Piranha bite. But it was out of the water, as they never attack any human being in their habitat. I had it on my hand to photograph it and the fish truned around and bit me in the hand...



Here some of the smaller Iriri characoids which live more near the shore and in bays, near vegetation and over sandy ground, rarely in rocky regions: 1. *Moenkausia xinguensis*, alive, for the first time, adult. 2. *Bryconops* sp. I "Iri", adult. 3. *Moenkausia* sp. I "Iri", adult. 4. *Moenkausia* aff. *lepidura*, adult male. 5. *Bivibranchia* sp. I "Iri", adult. It is a bottom dwelling characoid, filtering microorganisms out of fine sand. 6. *Moenkausia* aff. *lepidura*, adult female. 7. An engraulidid (family Engraulididae), probably *Anchoviella nattereri*. 8. *Piabucus dentatus* is also a peacefull characoid but this one can grows up to 18 cm in TL.



moving object with all power on the tent soil in vain. It moved on. Then I ran out and looked for the sandy soil, but nothing. Back in the tent it did not began to agitate again and all following impacts were useless. Only after I woke up Natasha and we shifted the tent got after two o'clock in the morning we had finally peaceful sand under us... apparently our tent had blocked the entrance and exit of some creature...

We reached the wooden hut of the *caboclo* Ben (= Raimundo) in the late afternoon of the third day. It lies about 200 meters off the riverbank on a hill (terra firme) and stands on stilts. Raimundo Guilherme de Souza lives here for 16 years with his wife Luzia, his three boys and seven girls. They live completely autonomously, on what they produce and only during the extreme flood period, the most once in the year, Ben takes his canoe and paddles down river, and crosses the water-

fall to Altamira. Ben told me this while his wife daughters were backing the daily *farinha* from the manioc root, which had for days been watered to eliminate the poison liquid. He said that when he first came here a few other *caboclo* families were living along the upper Iriri, but because of the constant low water level for more than one decade travel down and up the cataracts made is almost impossible to survive up here and everyone migrated to Altamira. There is one Indian tribe, the Wokarangma, an ethnic group of what is said to be still 31 individuals living somewhere deep in the forest, but never had any contact. Only one single Chipaia Indian, who was discharged by his tribe because he took himself a Brazilian women and has a hut somewhere, no one else live on this giant river today (except for gold miners in its headwater, 1000 kilometres up river, I found out later).

Enormous rock massifs stood out from the water in the environment of Bens hut and I collected unbelievably interesting fish. For example surely a new *Sartor* species, with the most unusual mouth formation evolved to scrape off standing in a vertical position in the curreant, the algae from the rock massifs. So far only three kinds are known: *S. elongatus* Santos & Jégu, 1987, which I already discovered 1983 in the Cachoeira de Porteira (Trombetas and Mapuera rivers); *S. respectus* Myers & Carvalho, 1959 of the Rio Culuene in Mato Grosso (which I was able to find also in the middle and lower Xingú several times, and now in the Iriri in community with the new species); and *S. tucuruense* Santos & Jégu, 1987, from the Rio Tocantins. This discovery is not new only for the genus but also from the point of species. Unfortunately these food specialists are not recommendable for the



Also in the Iriri region one can find bodies of water that dry completely up, but which during the high water period are connected to the main river, like this one. The remaining fishes are all eaten first by Piranhas, than by the birds and caimans, but before they die or are eaten they lay their eggs into the mud. I found here species of *Hypostomus*, *Squaliforma*, many characoid species and even thousands of newly hatched babies of all kind of fishes.

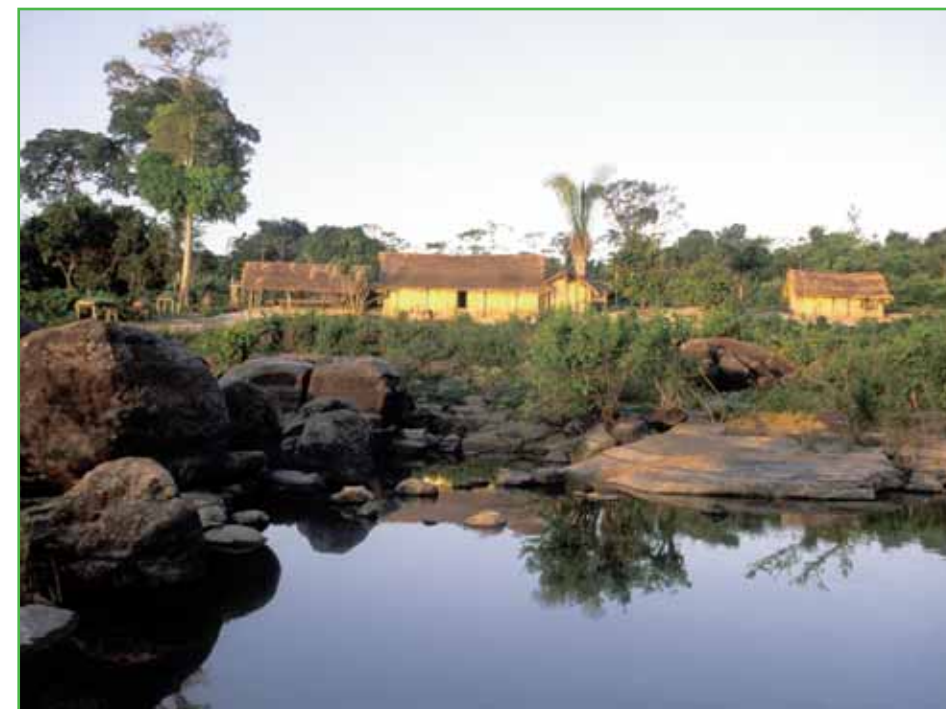


On top a two more loricariids found in the Iriri: 1. *Pseudoloricaria* cf. *laeviuscula* (but note: they live over sandy ground). 2. *Loricaria* cf. *lata*, a real beauty. 3. Also in mimicry live two characoid genera: a *Triportheus* aff. *rotundatus* (upper fish) and *Brycon* aff. *pesu* (lower fish), living sympatrically in the Iriri and one looking at them can hardly separate one from the other in nature. Both have a silver-shiny eye. Both have, besides their silver scales, a black band in the tail. And in addition there are two species, which look very similar and belong to the genus *Brycon*: 4. *Brycon* cf. *pesu* (note the large jet-black adipose and its humeral spot), and the second one, which for sure is a new species: 5. Adult *Brycon* sp. aff. *pesu* (small transparent adipose and tiny spot).





This is a typical *Teleocichla* habitat in the Iriri River a few hundred km up river. Giant rock formations are found here everywhere. Those must be a remnant from the once giant Guyana-shield, which got separated by the mighty Amazon River flowing suddenly direction east. In such holes hundreds of this elongated dwarf cichlid genus can be found, they also breed here. Seven species have been described, 4 from the Rio Xingú basin (which included the Iriri), 2 from the Tapajós river and one from the Tocantins. One of the unidentified 3 species I found here looked like *T. cinderella* (below), but the latter is only known from the Tapajós basin, not the Xingú. They are peaceful bottom dwelling species, but need rocky areas and caves, as well as sand. They live in habitats which aquatic vegetation is absent.



On a stretch of almost 600 km were we have done research, this was the only houses we found. The caboclo who lives here for 16 years with his family, is the only Iriri inhabitant in this region. He lives completely autonomous and travel, if at all, once a year during the high water season down river all the way to Altamira. They plant what they need, the fishes provide protein, and turtles (left) as well as Iguanas (right), are also eaten. But naturally in this gigantic primary rainforest area, such little hunting for those few persons, is insignificant... may it long remain in such a almost unique position and humans stay far from this paradise.



normal aquarist. The same applies to the fantastic coloured and very wide spread species which also belongs to the characoid family Anostomidae *Synaptolaemus cingulatus*. The latter was described by Myers & Fernández Yépez 1950 from the upper Orinoco, however it occurs in the upper Rio Negro, in the Xingú and elsewhere. My discovery in the Iriri was new. Here it lives sympatric with the two *Sartor* species.

I saw a multiplicity of *Myleus* and the well-known *Myleus schomburgkii* with its brought "Heckel-discus" centre bar, and I found out, that in the Iriri alone must live seven or eight species, which the late characoid expert of the world, Jacques Géry (he passed away at the age of 90 years old in 2007) wanted to classify as six different, mostly new species. There was also one species of the rare *Tometes*. Ben called the brightest coloured one which I saw under water „manteiga" (= butter), it is a swimming dream. With extreme long dorsal fins, gold-yellow tail, a black broad seam and large red anal fins. Unfortunately we did not succeed to catch this beauty, it was too fast, every time escaped from the seine or cast net. But still more fascinating fishes came ashore. Seven different *Leporinus* species, and all, except *L. maculatus*, were new, for science and for the aquarist (see photos).

First I saw a group of spotted *Leporinus*, which looked all the same, but swimming closer one could recognize that there were three different species. Two of them looked so similar that one could see the differences only by very detailed observation. The third one has at least three small bright red marks at



I almost forgot to show you some of the larger cichlids collected with the most interesting discovery of a new *Retroculus* species. Only 3 species have been described: *R. lapidifer* from the Rio Araguaia, *R. septentrionalis* from the Oyapok River in French Guyana and *R. xinguensis* from the Xingú river. 1. Now I found this one, I called *Retroculus* sp. 1 "Iriiri", it lived only in an affluent of the Iriiri, in the Rio Novo. But it seems to be a giant *Geophagus argyrostictus*. 2. Another very large specimen which resembles a little *R. xinguensis*, but its tail pattern is different, and its fins altogether distinct, its head and mouth. It is my *Retroculus* sp. 2 "Iriiri", which must certainly be new, the fourth *Retroculus* species. 3. To compare, I show the *R. xinguensis* I collected in the Xingú River. 4. *Geophagus* sp. 1, adult. 5. This is a juvenile of the new *Retroculus* sp. 2 "Iriiri". 6. And here again to compare: a juvenile of *R. xinguensis*. 7. A juvenile of the probably new *Geophagus* sp. 1 (see adult on top), and: 8. *Satanoperca* cf. *jurupari*. The latter is wide spread almost throughout the Amazon basin.

its ventral side and in the lower mouth region. Then there was one of which I thought it is *L. maculatus*, a wide spread species found to the north even in French Guyana and south in the headwaters of the Xingú. However after the catch in the aquarium I realized that there are two species involved. During their juvenile stage they resemble as an egg the other (only the new species is black at the mouth tip), but when adult they are different (see photos). The *Leporinus* group consisted of two banded species, which live sympatric and both have 9-10 black bars. One could be the genuine *L. fasciatus* and the other one *L. aff. fasciatus* is a new species being described now. The latter differs by salient black points on each segment of its scale as well as a yellow pectoral fin and a black edge briefly before the end of the caudal. All of the anostomids are extremely interesting for the aquariums.

I will skip to write about the loricariids as almost everyone was new to science and the hobby, to many of them we collected in the Iriiri and no space to mention all, but there are some photos enclosed.

When I asked in the evening Ben whether he knows some of the affluent of the Iriiri, like on its left bank the rios Curuá, Catete, Chiché and the Riozinho do Amfrísio and on the right bank the rios Iriiri Novo, Ximxim, Riozinho Jucatã, Carajá and Novo he said only the Novo would have flowing water at this time of the year. All other are stagnate or dry. Chico had however fear to take the *voadeira* further up the Iriiri, as there are to many rocks and all our spear parts have been used up. Well I persuaded Ben, who lives now so long here and knows each stone in the water, to come as practice and he agreed to lead us for two days despite its continuous bad attacks of malaria...

We reached the wonderful merging Rio Novo the next afternoon and went up all the way to its waterfall. Here grew enormous amount from Podostomaceae in the fast current, light red with rose-pink blooms. This was not only a new river (=Rio Novo) but also a new paradise. A fantastic untouched area were probably no man has ever set foot. The hours and days we spend her

in this uninhabited area would fill books. And also what we still encountered in this remote isolation of planet earth. But I want to tell you just one single highlight of this unbelievable expedition to untouched aquatic habitats. I have learned in detail about the unique habitat and the biology of this amazing characoid, which was described as *Moenkhausia heikoi* by Géry & Zarske, 2004 (see photos). Something I had not been able to see during my 1975 discovery, nor my collecting in 1999. The species grows to almost 8 cm in TL and is a swimming dream when adult, which I found out only now after collecting the adults here in the Iriiri (never in the Xingú, probably because they are eaten by predators). This unusually beautiful fish, and surely in the future a highlight for any characoid loving aquarist, I found the adults only by diving 2-3 meters deep – and only between rock columns (see photos). They live and spawn in this hideaway in the curren and their eggs are floated down river and hatch (those which are not eaten) and some end up in the Xingú. (Therefore isolated large animals are to be found only in smaller groups in the lower Iriiri, and if at all, in the Xingú. That is also why the reason the professional fishermen from Altamira never collected this beauty.)

The catch of these samples shown was extreme difficult, especially in the current, between the rock massifs in the depth, they always escape. Only after two days I had eight adult specimens.

A nightmare happened on the way back while I was trying to catch the only *Corydoras* species, in the Igarapé Pebo, where I also discovered three differently *Apistogramma* species. When I stepped with my hand net into the two meter broad creek I got suddenly electrical impacts, those continued to increase and I saw 6 (six) *Electrophorus electricus* – electric eels – of about two meters each approaching me. I do not believe in my whole fishing life was so fast I ever out from the water. And I still do not know how I escaped the approximately 4.800-volt-laden giants (everyone has an unloading capacity of up to 800 V)...

But as you can see I have survived, same as before my 57 attacks of malaria and again as each year for the last 40

years or so, I came back bring many new fish accessible for the most beautiful hobby of the world. And that is to be still for a long time to come...

*Epilog: The only bad news about this unique Iriiri and maybe the least inhabited region on earth, is that in 2004 a rich business man called*

*Gustavo Dos Reis Filho, known as Gugu, has opened a fishing lodge along the Iriiri in August 2004 and brings in rich people by charter plane*

*from Santarem on a newly built nearby landing strip for fly-fishing. There are still no roads leading to this paradise.*





Two biotope aquariums from habitats described on the past pages. 1. Authentic biotope from the lower Rio Xingú on this page. Aquarium with 1600 l and the following fishes: Two unidentified freshwater stingrays (*Potamotrygon* sp.), 10 small Peacock stingrays (*Potamotrygon motoro*), 10 red hook *Myleus rubripinnis* and black-barred *M. schomburgkii*, as well as 3 new *Myleus* sp., 6 adult Piranhas (*Serrasalmus altus*), 5 *Poptella* sp., 6 eye-spot cichlids (*Heros* cf. *severus*), 4 large suckermouth catfish (*Pterygoblichthys* sp. and *Hypostomus* sp.) as well as 6 golden whip-tail catfishes (*Sturiosoma aureum*). Water plants: There are no water plants in this habitat. In quiet bays grow sometimes water lillies (*Nymphaea* species), bladderwort (*Utricularia* sp.) and floating plants, like *Pistia stratiotes* and *Salvinia natans*, occasionally large sword plants, such as *Echinodorus grandifolius*. Decor material: dark rocks, slate, white fine sand. Some pieces of driftwood. The chemical water parameters were: pH 6.25 to 6.55, conductivity 21-22  $\mu$ S/cm, day temperatures: air 36.5 °C., water surface 28.5 °C. and at a depth of 2 m 27.9 °C (where most of the fishes shown live). See also: [www.aquapress-bleher.com/index.php?option=com\\_content&task=view&id=80&Itemid=53](http://www.aquapress-bleher.com/index.php?option=com_content&task=view&id=80&Itemid=53)



This biotope aquarium is a typical Rio Iriri habitat. From the area where many Myleninae (*Myleus*, *Metynnis*, *Mylossoma*) are found. Here a 450 l aquarium. Fishes: 11 adult *Myleus schomburgkii* (2), *Myleus* sp. (3), *Metynnis fasciatus*, *Mylossoma duriventre*, and *Brachychalceus* sp. (1). Several *Peckoltia* sp., *Bariancistrus*, *Parancistrus*, *Hypancistrus*, *Pseudoloricaria* sp., (4) and *Loricaria* sp. But also a couple of large loricariids: *Pseudacanthicus leopardus* (5). One can also place some cichlids, such as *Retroculus* sp., *Geophagus* or *Satanoperca* sp. Decor material: fine white sand, gravel and lava stone, as well as some yellowish stones (see 1), sometimes called: yellow stone. The lava stones should be played in layers (4), because the smaller loricariids feel immediately like in their own home. One can see it (this photo was taken a few minutes after they had been placed). Some of biotope aquarium can also be seen under [www.aquapress-bleher.com](http://www.aquapress-bleher.com) and just go to Bleher's Biotopes.

One of Asia's largest rivers, the Brahmaputra crosses the entire length of the autonomous province Assam, in India. This river, also called Tsangpo-Brahmaputra, is a trans-boundary river. From its origin in southwestern Tibet as the Yarlung Zangbo River, it flows across southern Tibet to break through the Himalayas in great gorges and into Arunachal Pradesh where it is known as Dihang. It flows southwest through the Assam Valley as Brahmaputra and south through Bangladesh as the Jamuna. There it merges with the Ganges to form a vast delta.

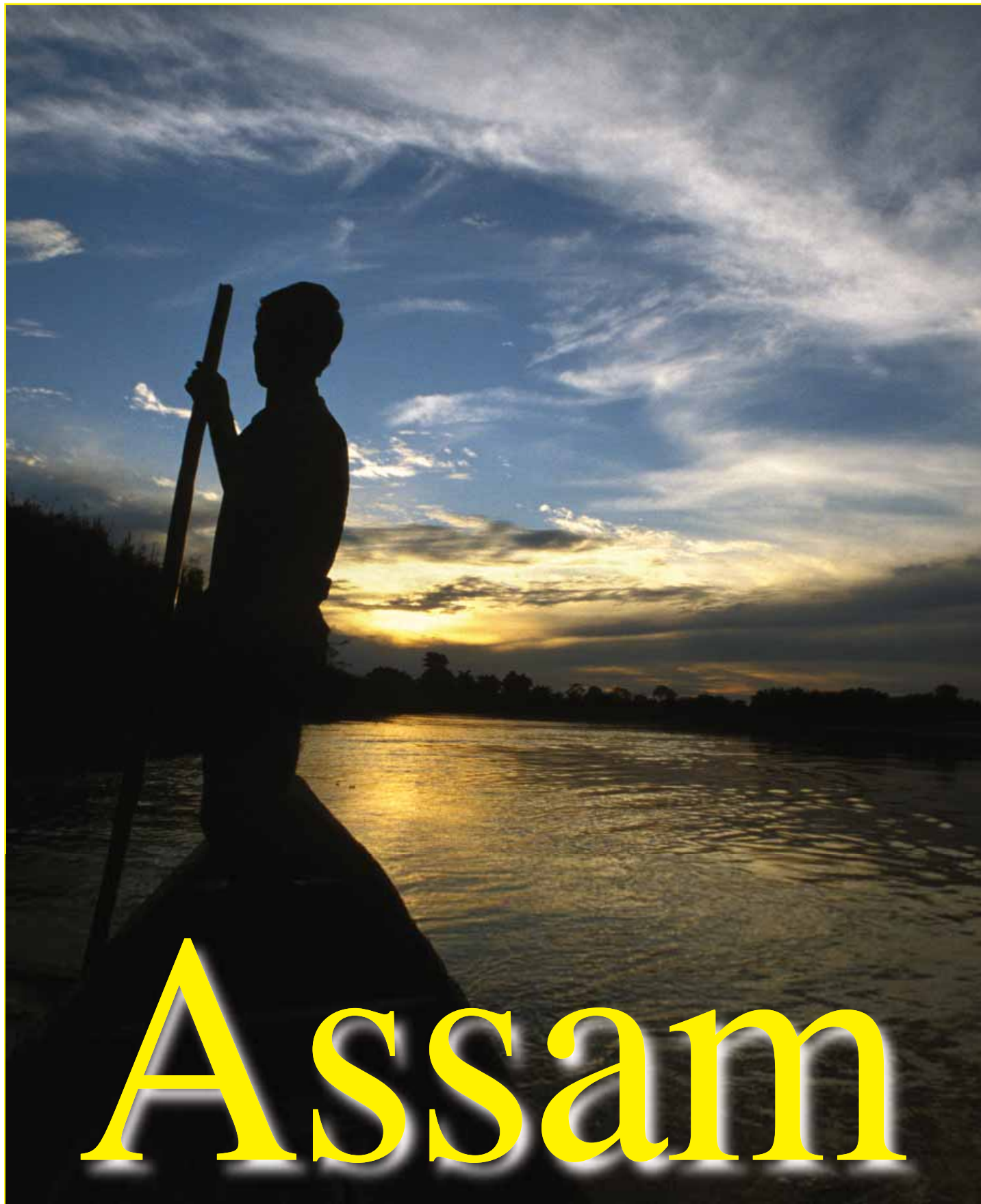
About 1,800 miles (2,900 km) long, the river is an important source for irrigation and transportation and its affluents are rich in aquatic fauna.

Text and Photos Heiko Bleher

Heiko Bleher's field trips through India included the little-known Assam region

# Assam





Assam comprises the Brahmaputra and the Barak river valleys and the Karbi Anglong and the North Cachar Hills. With an area of 78,438 km<sup>2</sup> Assam currently is almost equivalent to the size of Austria and surrounded by the Seven Sister States: Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura and Meghalaya. These states are connected to the rest of India via a narrow strip in West Bengal called the Siliguri Corridor. Assam shares international borders with Bhutan and Bangladesh; and cultures, peoples and climate with South-East Asia. Only after the British occupied the region following the Treaty of Yandaboo of 1826 it became India.

Road blocks were everywhere throughout New Delhi: there had been two shoot-outs with submachine guns in South Delhi less than two weeks before my arrival, leaving dead bodies scattered everywhere – children, woman, and old men – a Sikh counter-attack in their fight for the “liberation“ of Khalistan, and independent state (Punjab). The bloodshed had not ceased since the terrible assassination of Prime Minister Indira Gandhi on the 31<sup>st</sup> of October 1984.

Sacks were piled along Rao Tula Marg and the Ring Road entering Delhi, with MGs and soldiers behind them – a-war-like scenery. Deepak Nopany one of the nicest guys in the fish business, had flown in from Calcutta early that Sunday morning to be at the airport when I arrived from Frankfurt. My flight was loaded with Pakistanis, Hindus, and Sikhs. I felt I was in India the moment I boarded the aircraft at Frankfurt Airport.

I had called Deepak several days before to find out how the weather was in Assam because I definitely wanted to go there. The last time I didn't get a permit, since Assam is off limits to the white man and is a restricted area. They told me then it would take six months to get an entry permit. This time the Consulate General in Frankfurt told me I could get it in Delhi the same day with my business visa. That was a joke!

Fortunately Deepak's uncle, Mr. J. Daruka, and two other friends had already put their machinery in gear. On top of it, days before, Deepak had requested a letter of recommendation by the MPEDA (Marine Products Export Development Authority) and also from the Central Bureau of Investigations. With this “force and backing“ we approached the Loknaya Bhavan Building in several auto rickshaws. Filling out the form was an adventure; getting a copy of it was an even bigger one! “Sorry, you can only enter the Bureau of Home Affairs after 2 P.M., but you better get here by 1:15 P.M.“. The queue was already 200 meters long, but Deepak's uncle had sent a person ahead and we got in at 3 P.M. After being sent from one section to the net and filling out more forms we finally reached the



Throughout the Brahmaputra region one encounters fishermen. They carry their cast net and or a seine across very dry, desert-like, land. The mighty Brahmaputra has also been hit by the global warming and has less and less water almost every year. I have seen it vanish... (See also first double pages).

room of Mrs. Gulati, a lady who reminded me strongly of Mrs. Indira Gandhi, who was firm in her statement that I might be able to enter Assam in six weeks. The comments from Frankfurt didn't help, nor the eight letters... not even several of my publications that I had brought with me helped. Finally, the word "business" (export of aquarium fishes) did it. At 4 P.M. she told me to return the next day at 11 A.M.

To celebrate this, Deepak's colleague from the university Eddy Singh and his

lovely wife invited us for a typical Rajasthani dinner on the terrace of their beautiful hideaway. Mrs. Anita cooked kofa, puris and nan bread (which I only knew from the famous Lucas Carton Restaurant in Paris), and special rice. It was finger-licking good (everything is eaten with the hands anyhow). Back in the hotel, my announced call to Italy didn't get through and my body couldn't get a rest. After the third night without sleep I moved out. This Jaipur Inn run by a bear-like Sikh was on a heavily travelled street, and every time a car

came by I fell out of bed. Five cars per second didn't give me much time to stay in it!

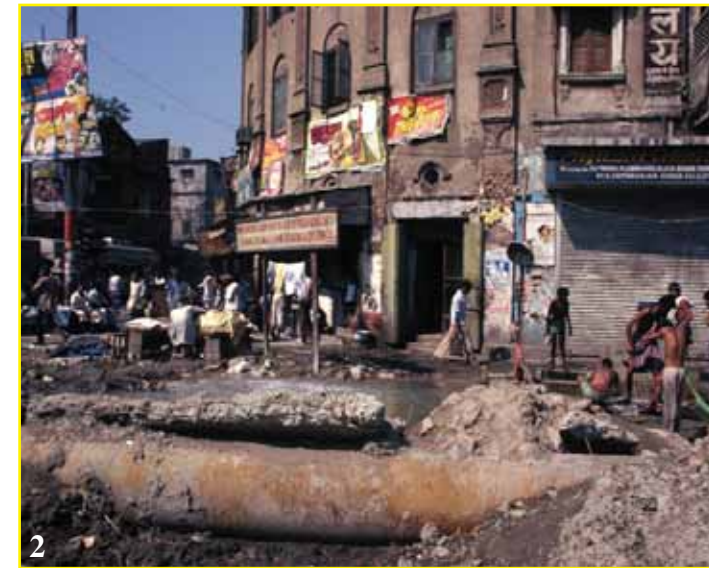
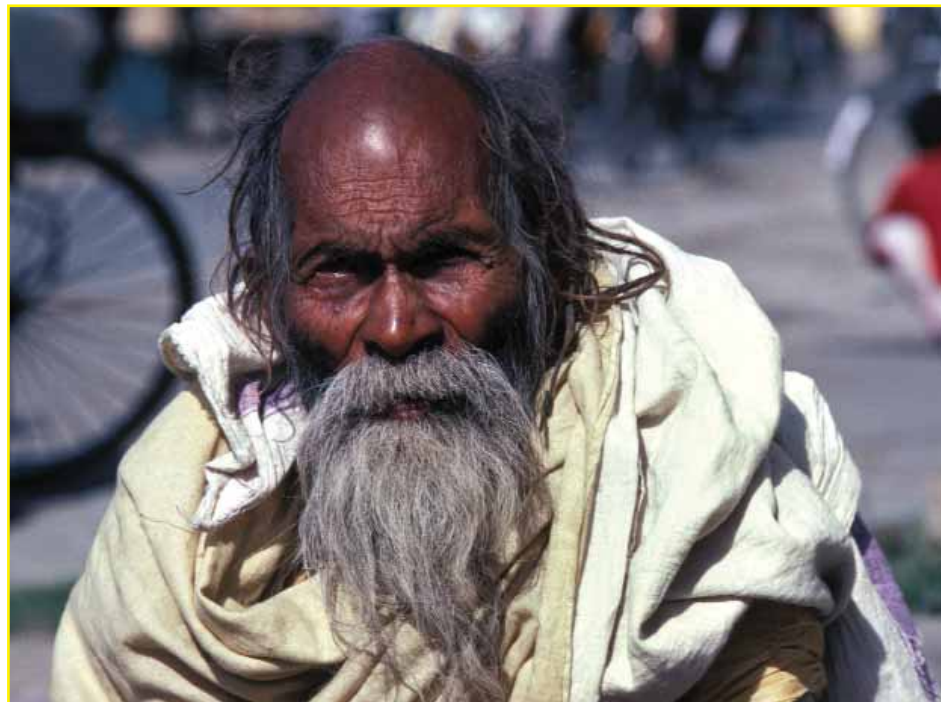
Everything worked out quite smoothly. I received a green light from Mrs. Gulati and crossed town to House Bhagwar, the foreigners' registration office. The place was crowded with punks, hippies (here they still exist), and weird people with tattoos and their ears covered with rights requesting permits for Nepal and Sikkim. I got ahead after filling out two additional forms and getting copies.

At noon I rushed to Indian Airlines where I heard that my reservation for the afternoon flight had been cancelled. I bought a ticket nonetheless. When I got to the plane, boarding was closed: This seems to be my destiny! I showed them my fresh permit and flooded them with magic words (business, export, etc.), which made them delay the departure for us. Finally, after years of trying. I was on my way. Possibly, the first "white man" (I ask myself sometimes how much of a white man I am, if I start thinking...) heading for Assam in search of ornamental fish.

Assam, known worldwide for its tea, produces 58% of India's and 30% of the world's tea. So you fishy tea drinkers: every third cup is made with dust from Assam, just remember this the next tea time and recall those beautiful fishes. Also, the lovely fertile valley bears over 50% of India's oil and natural gas. On the plane from New Delhi to Guwahati I opened the new paper and read about the topic "Oil To Increase Output In Assam". The oil would require 39 new drilling rigs and an additional manpower of 15,500 persons over and above the existing 8,542. No wonder the only other white men who got permits worked with oil, one German and two Russians. I saw this was my last chance to fish. But it would become even worse!

India's eastern-most state has common boundaries with Bangladesh and Bhutan on the west and China and Burma on the east. Perhaps because the

In New Delhi I drove around in the incredible traffic jam always with a motor rickshaw (upper photo), as they can move much faster than a taxi. And are a lot cheaper. Some old man (left) looked at me, I do not know why...



In Calcutta, our point of departure to Assam, the Ghandi house (1). And construction in the main street (2), does not inhibit the traffic here or the people. Bollywood (India's movie "factory") produces more movies per year than Hollywood (3). More than twice as much. Bicycles and cows dominate the main streets (4). And the bar-foot-driven rickshaw (5) is here the most common (and lowest prized) transport available. The public buses are over-crowded all the time (6)...



richest state of India is somewhat isolated geographically, some people I talked to still believe that Assam is inhabited by uncivilized, barbaric people. The name "Assam" comes from the Ahoms, a Mongolian tribe from Thailand that came across the Petkai Range through Myanmar (Burma) and conquered Upper Assam in the 13<sup>th</sup> century. They ruled for 600 years. The Assamese people are proud that they successfully resisted the invasion of the Moguls seventeen times between the 13<sup>th</sup> and 17<sup>th</sup> century. The Mogul empire under the indomitable Akbar, who ruled from Persia to Bengal (including today's Bangladesh) with as many as 150 million people and who at the height of his power (in the 1600s) exceeded by far his contemporary, Queen Elizabeth of England, in wealth and number of men under arms, was dominated by the Assamese. By 1842, the entire Assam Valley came under British rule. They started tea cultivation, established sawmills, started coal mining, and explored for oil by 1890.

Late at night in Guwahati I was escorted from the airfield to the hotel. Because my permit was only for Dibrugarh and vicinity I was guarded all night like a prisoner, but Deepak made it possible for us to sneak out to visit a pet shop owner downtown. Hiding on the floor of the backseat during the one-hour ride in the old Ambassador wasn't very comfortable on this bumpy road. Matysa Aquarium was closed, of course, but Deepak again found the owner, Mr. Sarma, in this darkness (there was no streetlight). Interestingly enough, the name Matysa in Sanskrit (said to be the world's oldest language) means "fish", Sarma explained while unlocking the huge wooden door. In front of me I saw light bulbs with colourful shades swinging over the framed tanks filled with guppies, platy and albino tetras – not one of Assam's beauties was present. One aquarium bore two-inch brown discus at US \$50.00 each, *Synodontis nigrita* for US \$30.00 and small cardinal tetras for US \$5.00. Deepak explained they take landed cost time 10. That I call a healthy calculation for livestock.

Flying east over the gigantic Brahmaputra along the snow-capped "Top of



the World", the unique Himalayas, in the early morning hours was breathtaking.

Dibrugarh's small wooden airport building was my home for several hours until the security had all my papers checked and had given me a special travel permit which I had to present in each town I passed through or visited. They had picked me out of the deplaning passengers before I had set one foot on the ground.

The "white" muddy, low waters of the broad Brahmaputra that flows very slowly in narrow channels had almost

no fish. A short stop in Dibrugarh made me realize that it would be a waste of time to stay at this river, which is Assam's main way of transporting goods, chiefly timber! And there is very little timber left. "The last trees" are cut near the Chinese border. At the fish market I discovered some unusual large *Wallago*, over 125 cm with irregular large, black vertical bars. None of the five valid species known fits this description or the size, but the main key to the genus applied (forked caudal fin, one pair of long maxillary barbels and mandibular barbels, occasionally rudi-



mentary or small, adipose fin absent, pectoral fins with 11 to 14 rays, etc.). Only I couldn't figure out the species possibly *W. attu*. Another fantastic fish I had never seen before suddenly jumped from a tabletop onto my feet a beautiful black-spotted *Channa* with bright golden colours, and emerald-blue head with an even brighter spot on the base of the red- and black banded pectoral fins.

The snakehead fishes have fascinated me for a long time, black monster about 110 cm long in Malaysia and exhibited this black beauty already as early as 1986 at the Interzoo in Wiesbaden. As I had only one piece, the



Flying into Assam the Himalayas, the world's highest mountain range, is on a clear day very well visible (left-hand page). And once landed everyone looks at me, no matter were I drive, sit, or walk. Like they have never seen a white man with a beard...

species was never classified and is now swimming in a Tokyo show tank, tame as a pet, eating everything, not only prey. These fish are not as bad as it is always said.

During my stroll around I came across a third unusual sight a 120 cm long clown knife-fish, *Chitala chitala*. Always described as reaching a maximum length of 90 cm and with six large clack sports in the lower back portion of its body, this one was quite different. Besides the size, the black spots were very small and spread all over the lower body and fin. To my concern there is a lot of classification to be done in the African and Asian snakeheads (the

Channiformes) as well as in the knife-fishes (Notopteridae). I personally have found so many colour forms that it seems impossible that there should be only the few species described.

Deepak was anxious to get to Tinsukia, and the taxi, and old Ambassador, was waiting. About three hours later in Tinsukia we set up our headquarters for a few days in the Hide away Hotel. The same afternoon we went on toward Guijan on the Dibru river, an effluent of the Brahmaputra.

I was amazed to find skilled fishermen everywhere. Swapan Dasi, a 26-year-old friendly Assamese, was my help for the rest of the day. The Dibru was edged by millions of giant *Vallisneria*, *Potamogeton*, and in the bays there were lots of *Nymphaea* (water lilies). I knew there must be fish. The water was muddy grey, but fortunately the bottom was mostly sandy, so we



didn't sink into the soil too much while seining upriver.

First a striking yellow-goldish fish with a silver lateral line and red in the fins, which I thought it was a tetra, but we all know there are no characoids in Asia! I found out later that this rare fish was *Amblypharyngodon mola*. Then another golden fish, the catfish *Mystus tengara* (other colour forms come from Darjeeling, Bihar, even Pakistan and Bangladesh). The third amazing golden fish (I had hit the "jackpot", a gold mine!) was the "Asian cory" (that is my own invention): *Chandramara chandramara*. This totally unusual small catfish has rarely been seen alive before. There is no aquarium publication up today which had ever mentioned this fish, nor has anybody seen a photograph before. I am sure you will all see this beauty for the very first time. Described by Hamilton 1822, it was called *Pimelodus chandramara* first. Jayaram established the monotypic genus in 1972. There is only one species so far known of this unique fish, which is only found in Assam. It is a fish for our hobby equal to any free-swimming *Corydoras* and even more peaceful and definitely more attractive than most. A great achievement.

At a branch of the Dibru, one hour away from Guujan, the lucky strike continued – among countless aquatic plants, which made it extremely difficult to seine – fish galore. *Colisa chuna*, *Badis badis*? (a colour form with 8 to 10 irregular black bands – which could well be the mysterious *Badis dario* that nobody has seen alive), *Mystus bleekeri* (I believe that this is the first time this attractive pimelodid with two extremely long maxillary barbels was photographed alive), *Labeo calbasu*, *Xenontodon cancila*, and "Lauputi" (Assamese name for *Chela cachius*). I was so amazed by these quantities of fishes and mostly varieties never seen

Gigantic parts of the once extremely large Brahmaputra have turned into desert-like regions (1). Trucks come to haul away sand for construction (2). This also does not help the drying up riverbed, neither the logging. Assam was known for its Sal tree forests and forest products, much depleted now. The last few trees in the Brahmaputra valley have to be cut (3)... Fortunately parts of this once so large river, in channels, the traffic of

alive before, that only Swapan's screaming "punti, punti" made me aware of the fact that I wasn't day dreaming.

Swapan is from Bihar, and over there the fishermen call all barbs punti (now you all know where the scientific name *Puntius* for Asian barbs comes from...); in Assamese it's "putthi".

Besides the above-mentioned our net held chiefly barbs of the genus *Puntius*: *gelius*, *ticto*, *phutunio*, *sophore*, and *P. sarana sarana* in large quantities.

Completely exhausted, but with incredible joy, we went back to Guujan and had a cup of Assam tea – the British way with lots of milk and sugar.

As there was a general strike the next day from 5 A.M. on, we woke up at 3 A.M. to hire a car. But in vain. By 5 A.M. we gave up. Due to a swollen foot from a rusty wire that I had stepped on during fishing, I had a high fever by 7 A.M., and I thought my malaria was breaking out again. Fortunately I controlled it after three hours of sweating. My permit for Assam being so short and not wanting to lose time, I asked Deepak to find some bicycles (still the most common vehicle in Indian), although I was still very weak, and off we went on my first bicycle fish-collecting expedition. So far I had only done it by plane, hydroplane, helicopter, dugout, canoe, boat, motorboat, and all sorts of vehicles, from a balloon, and walking, but never with a bike!

We passed endless tea plantations and shy Assamese women picking the leaves. Then kilometres before our destination Deepak's bike had a flat and we walked the rest of the way. Since the fishermen were on strike also, we were forced to paddle alone up river. Only late, just before sunset, did we reach the upper Dibru. While pulling the net in a beel (Indian word for al-

vessels can still take place (4), but there are no tourists... Fishermen can be found everywhere along the Brahmaputra valley, and in its affluents (5). In some places the river bed has receded tremendously and the heavy wooden boats have to be lowered down from high up (6). With several of them we travelled doing research in different habits (7) often until late at night or at least into the evening (8).





an endemic species. The head is slightly shorter than in other species. It has a red eye and irregularly coloured scales: some are mainly of red and others are light blue, the pattern continuing throughout the body. The upper and lower lips are dark on both side – marine blue. Of the four pairs of gills the lower one are of an un-believable dark cobalt blue with delicate white edges. The dorsal fin has 34 light blue rays, which are crossed from the base obliquely by about 8-10 chocolate brown, uneven broad lines beginning at the end of the gill cover and extending all the way to the caudal. It has a broad orange edge, which is again edged by a soft white line from the very beginning to the very end of the dorsal fin. The

most dry riverbeds), we had a magnificent view of the white, snow-capped Himalayas changing from fire red to a golden yellow and finally into a soft blue and silvery gray. It made me realize how close I was to the top of the world! I suddenly felt something very special before the total darkness of this moonless night.

And just then I had the most indescribable catch in the net: a *Channa* species with unbelievable colours. The “Rainbow Channa”, as I named it, “probably a new dwarf species” I thought (later described as *C. bleheri*). I had never seen it in local markets (most snakeheads are important food fishes throughout Southeast Asia), and it seems to be restricted to this small area,



We slept some nights in tents near the riverbank where we had placed our traps. (1). The catch in the often very turbid water consisted of mainly different loaches and some unknown cyprinids. We suck in deep into the mud... Ducks and other birds are found abundant still, the river is a paradise for them and specially the smaller bodies of water and rivers flowing into the Brahmaputra. In one place we came to a nearly dry river bed (4) and noticed that some women and children were digging into the ground (5)

caudal, with only 14 rays, has even brighter colours: six to eight large red spots, each always covering only one ray in the centre of the tail, with a light green and blue shaded margin. There are some dark red smaller spots more toward the caudal end. The dorsal fin-base is enhanced by a strong orange line. The anal fin, with 24 rays, is light blue at its base turning into a dark cobalt blue and finally into velvet black edged by a thin orange line. The pectoral fins, with 14 rays, are orange-yellow and transparent, with 3-4 dark brown vertical lines at the base and a few horizontal lines and spots toward the end.

I have never seen such a potpourri of colours in any living freshwater fish.



“Rainbow Snakehead“ is more than justified. Picasso, Miro, and Calder would have found their master had they seen this swimming unmatched dream.

This night I had a most unusual dream: that a monstrous fish conquered the world of fishes, bringing the disastrous spreading of *Tilapia* species to an end. A predator eating everything away, being attracted by all other fishes because of its incredible colours which were indescribable – like a rainbow.

Two more days of exhausting collections followed in areas never ichthyologically explored. We found the most unusual *Botia geto* (which is actually *B. rostrata* now, a fish that changes color completely from juvenile to adult) at the Buri River, while we sank deep into

and I had to see what they are doing. Soon I found out, that they were collecting live fishes deep in the mud.

Fishes living in mud without a drop of water actually. Before we knew that there are survivors like the lungfishes and some predatory characoids (family

Erythrinidae) as well as some loricariids which can survive without water for long period of time. But cyprinids (including loaches), and labyrinth fishes without water – and according to the native women already for several month, this was unknown (6).





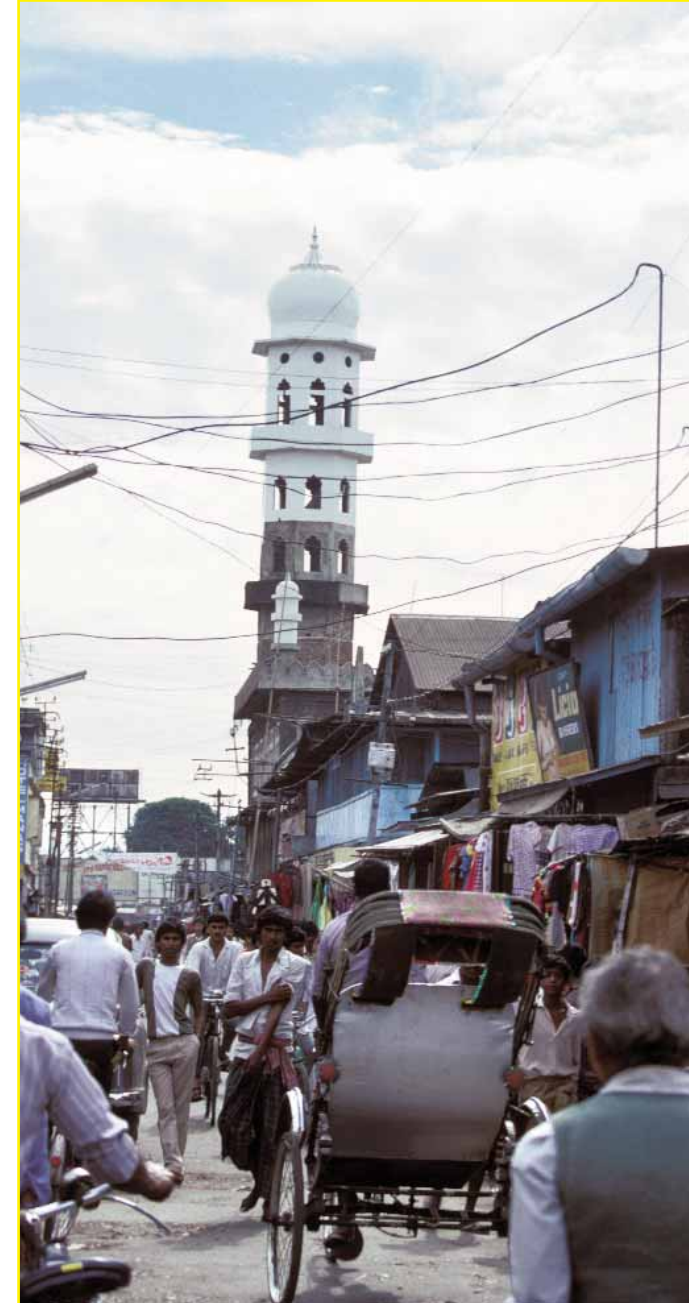
the morass. Amazing *Colisa fasciata* (never seen with such bright bands), *Colisa chuna*, *Channa punctata*, *Garra lamta*, and a very interesting *Lepidoccephalus goalparensis* (Pillai & Yazdani, 1974), which the locals call “Bottia”. I dug the real *Chaca chaca* out of the mud (the one up to date found in the trade is *Chaca bankanensis* from Thailand, the southern Malay peninsula, and Indonesia, which has been misnamed all along) along with countless other fishes which have also never been seen alive before. I don’t want to bother citing all the names of what is to me the richest collection of fishes ever seen at one place in all of Asia: take a look at the many photos in this article.

Only one final note on a peculiar incident: during a night catch Swapan helped me bring ashore thousands of small catfish to the totally sandy beach! I thought I was on bank of the Guaporé River in Mato Grosso with a net full of *Corydoras*. There were uncountable quantities of short, brown, *Corydoras* like fish less than an inch long, wiggling their cute tails. In the same batch similar-looking creatures with a prolonged caudal fin ray and oval-shaped, compressed heads! A South American *Loricaria*? A *Glyptothorax* species? Later I found out that this gracious catfish had the strange name of *Conta conta* and was first described by Hamilton in 1822, at the time the German Republic was born. The *Corydoras*-like fish were *Hara hara*, also a small sucker catfish (and also named by Hamilton).

Both beauties are a treasure for any home aquarium, never seen before and hopefully available soon.

During further night catches we had the opportunity to catch with a “dheki jal”, which are nets covering the rivers from one side to the other. This particu-

The city of Dibrugarh, situated on the banks of the River Brahmaputra, in the Upper Districts of Assam, India, is the gateway to the three tea producing districts of Tinsukia, Dibrugarh, and Jorhat. These three areas account for approximately 50% of India’s Assam tea crop and this gives Dibrugarh its rightly earned sobriquet as the Tea city of India. Oil and Timber are the other big two industries in and around Dibrugarh. And buses depart from here to all Assam destinations.



Tinsukia is a city and a municipal board in Tinsukia district in the state of Assam and only 84 kilometers away from the border with Myanmar. Hailed as the business capital of Assam, the place has a heady mix of Assamese, Bengali and Hindi-speaking people, located at the heart of the town. Tinsukia is also a major railhead of Assam. It is one of the fastest developing cities of India and one can travel there either by train or by a flight to Dibrugarh as we did and then by taxi. Tinsukia presently it houses the biggest railway station of Assam.



1



2



3



4



5



6

At the Tinsukia market, betel nuts are sold (1), like throughout Oceania, it is preferred by the people to chew on every day. For the sweet tooth, brown sugar is sold in bloc pieces (2). And every kind of nut (3). But the largest part of the market is the fish section. From the Brahmaputra basin about 225 different freshwater fish species have been recorded and at least 30% of those can be considered ornamental fishes for aquaria, but here people eat them... Even the smallest ones, like *Colisa*, small *Puntius* species, *Rasbora* and others (6). If there was an organisation to export these jewels the local people could earn much more than by eating them, as there is very little, if nothing on them to eat... *Channa* species (5), especially those, which grow very large, are the protein source number one here.

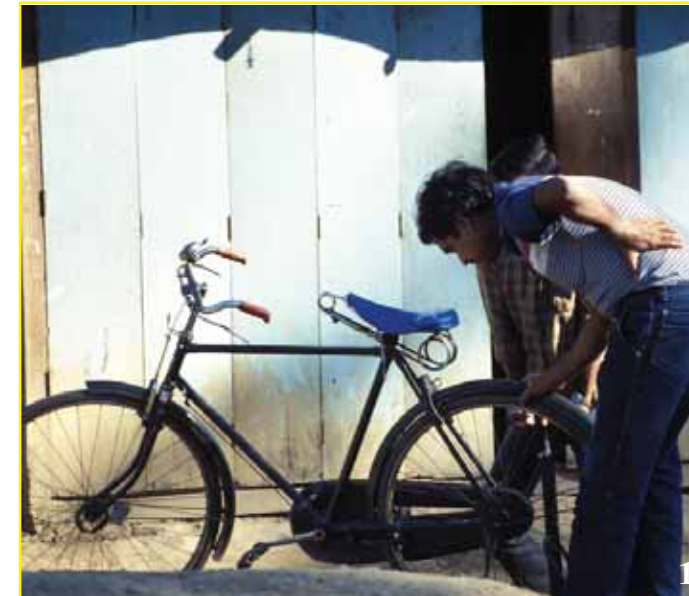
lar one was operated by and 8-year-old boy (younger ones can handle it, too), and he cleaned the riverbed in one night! Before they reached the market in the early morning hours I escaped with a 5 cm (2 inch) *Devario dangila* of the most unbelievable emerald-green and cobalt-blue with golden stripes and spots. Also collected were the famous *Devario devario*, giant *Chanda ranga* (about 10 cm), *Labeo dero*, and more and more and more.

I left Assam and its proud people. They are proud without any hesitation.

Proud of their chronicles (the buranji), which were written in the 13<sup>th</sup> century and are not found anywhere else. Proud of always having been independent (until the British rule). Proud of their land of plenty, their self-sufficient economy and non-existence of beggars. The people of Assam have been struggling for a long time. They perceive themselves as having been neglected by the rest of India and the world. During my research I came across an "Indian Express" newspaper note by Rajmohan Gandhi, grandson of

Mahatma Gandhi, who wrote: "The rest of India does not see us. If recognized, we are not remembered. And we are not heard. This has been the charge of citizen of Northeast against the Indian majority".

I hope this doesn't happen to those incredibly beautiful collected fishes, which are now, or soon, available for our enjoyment and that of future generations. In Assam, unfortunately, the countdown has started and no one will stop it. I hope my struggle was not in vain.



1



2



3



4

There was no taxi so one of our "expeditions" to collect was by bicycle and Deepak had a flat... (1-2). We crossed gigantic tea plantations (3-4). From here comes the famous Assam, a black tea named after this region. This tea, most of which is grown at or near sea level, is known for its body, briskness, malty flavour, and strong, bright colour. Assam teas, or blends containing Assam, are often sold as "breakfast" teas. English Breakfast tea, Irish Breakfast tea, and Scottish Breakfast Tea are common generic names. Historically, Assam is the second commercial tea production region after southern China. Southern China and Assam are the only two regions in the world with native tea plants. Assam tea revolutionized tea drinking habits in the 19th century since the tea, produced from a different variety of the tea plant, yielded a different kind of tea.



1



2



3

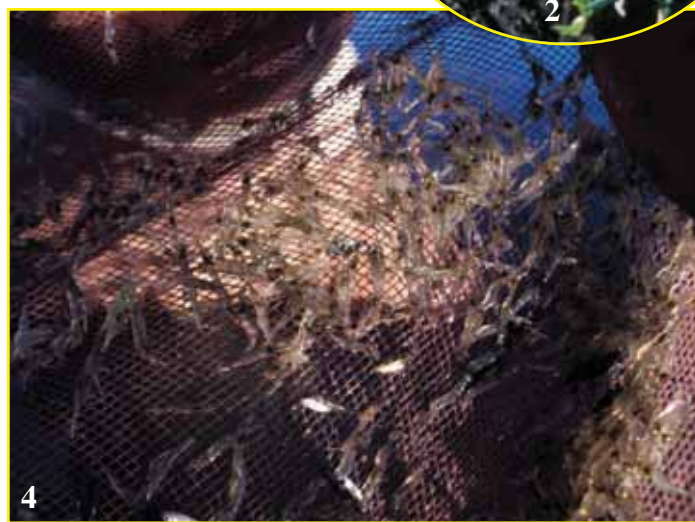


4

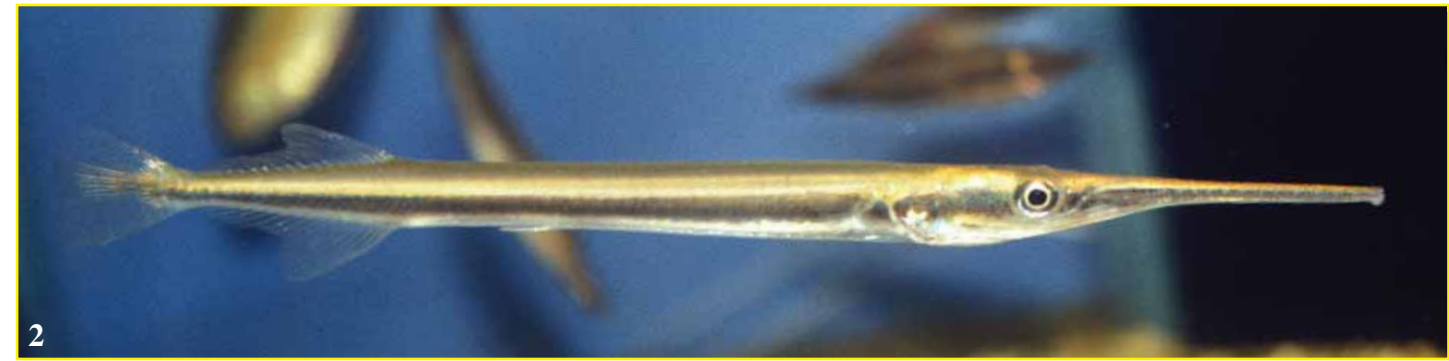
The affluents of the Brahmaputra, and specially those habitats not destroyed, have an tremendous fish assemblage as mentioned before. It is impossible to show all species collected, just a couple of habitats. The above (1) is near the border with Myanmar and besides new dwarf snakeheads I found here (some have already been described, see also following pages) there are millions of loaches which we collected in traps (2). Some of the loaches (3) are unfortunately not very popular among aquarists, although they are active beauties for smaller aquaria, also this *Puntius* (4). And *Puntius* are really abundant.



Such hardly untouched black water biotopes, have for sure a large species community. Under the floating *Eichhornia crassipes* were millions of fishes, labyrinth fishes, unusual catfishes like *Conta conta* (one thinks they are South American loricariids), *Gagata gagata*, *Hara hara*, *Batasio* sp., *Chaca chaca*, or the tiny, hardly 10 mm long, *Erethistes pusillus*, over sandy ground. But also cyprinids of the genera *Puntius*, with the magnificent *P. conchoni* which has its origin here and is in its biotope here extreme colourful. We selected some of the most unusual ones collected in the plants and over sandy shores (see next page).



But even here the water was drying up and the aquatic plants, such as *Potamogeton* sp., were starting to grow emers (1-2), what I have never seen them do in any part of the world. *Potamogeton* species belong to one of the few truly aquatic plants. In the seine were many fishes, with every scoop we came up with new ones and another variety, this beautiful habitat was untouched and the speciation great. I am sure there are still quite a few new fishes, and specially interesting for the aquarium hobby to be discovered in Assam, to little have been done in this remote part of India. Here an amazing *Chanda* species of almost 10 cm in TL (5), *Devario devario* (6), and the catfish I call the Asian corydoras: *Chandramara chandramara*, (7) as it does not grow larger than its South American "brother" and also is a bottom dweller.



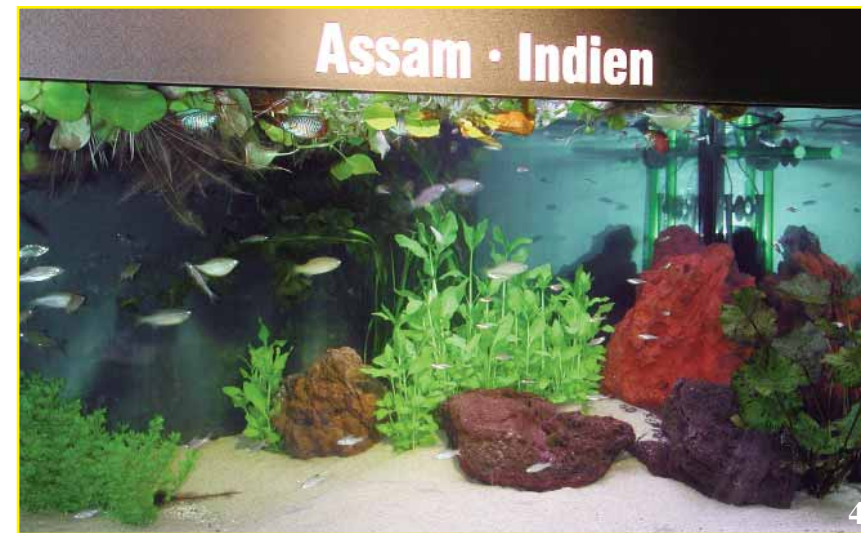
Here some more of the unique fishes of which some are endemic to Assam: *Xenentodon* cf. *cancila* (1) which looks not typical here that the type species: *X. cancila* (2). The *Rasbora daniconius* (3), a real beauty, has a very large distribution pattern, in many parts of India, but is different in each one of its habitats (morphology, colour pattern, etc.). Also this bright golden cyprinid (4), probably *Amblypharyngodon microlepis*, was breathtaking and should be a beautiful ornamental fish. Again another colour pattern (or species?) of *Chandramara chandramara* (5), my "Corydoras" and another unusual catfish: *Batasio* cf. *tengana* (6).



If one wants to have an Assam biotope aquarium with snakeheads (i.e. *Channa bleheri*, lower) and mates, or an general Assam biotope aquarium I want to give some important advice how to do it correctly and be ideal for your fishes:

1. The dwarf snakehead biotope (which could be *C. bleheri* (2-3), *C. stewardi* or a colour form of *C. gaucha*) should be decorated in an aquarium of at least 200 liters. (I always suggest: keep a small group of dwarf *Channa*, of at least 6 or more, with 250 liters, or more.) Decorate it with sand (does not have to be very fine), some gravel, stones and driftwood, and definitely leaves (1) as they like to hide between leaves in nature. Take leaves from nature out of the water, or dry leaves (not green ones) and pour hot water over it and sink them in a separate container over night. You can (should) add some floating plants (not all dwarf snakeheads are mouth brooders, some make nests and others place the eggs into the roots of floating plants like *Salvinia*, *Eichhornia* or *Pistia* and they want shade). If one wants plants, than *Ceratophyllum demersum*, *Potamogeton crispus*, or a *Hydrocotyle* species (as above). Filter, I suggest a biological filter, better external (or built in behind) with some medium strong flow (better less strong) and the bigger the filter, the better. It is very important, that the tank must be very well covered, as all snakeheads are excellent jumpers. They make it even through the smallest open corner. Alternatively it can be an open aquarium, but it must have at least 40 cm without water... One feeds *Channa* with fish pellets (if they do not take it right away give fishes, like guppies, or baby fishes put no spiny ones). They will take frozen foods also. But a balanced diet is the best.

2. For a general biotope of Assam, or better Diburgrah a smaller aquarium can do, but I suggest at least 120 liters. Decorate it with fine beige or white sand, a nice piece of drift wood, some lava stone, or other dark stones (4) and the following plants (if possible) *Ceratophyllum demersum*, *Bacopa* species, *Hydrocotyle* species, *Nymphaea* species and also floating plants like *Ludwigia*, *Salvinia*, or *Azolla*. The fishes should be a selection of about 10 *Hara jerdonii* (8), 4-6 *Erethistes* species (7), 6 *Conta conta* (if you can get looks like *Rineloricaria*), 4 *Gagata gagata*, 6-10 *Oreochthys cosuatis* (5) the beautiful small barb,



5 *Botia dario* (6), and some smaller *Puntius* up to 12. Also small 6-10 *Danio* species (i.e. *D. rerio*) and a few *Dario dario* or *Badis badis*. Normal biological filter and this aquarium can be open. Good balanced food is important. The water parameters should be for both biotopes pH 6.0-7.5, conductivity 20-100  $\mu\text{S/cm}$  (*Dario dario* needs pH below 6 and low conductivity, its tank mates can take it well), temperature 22-28°C. The light bulbs on both biotopes should colour enhancing of the great fishes (and maybe for the latter a plant lamp also).





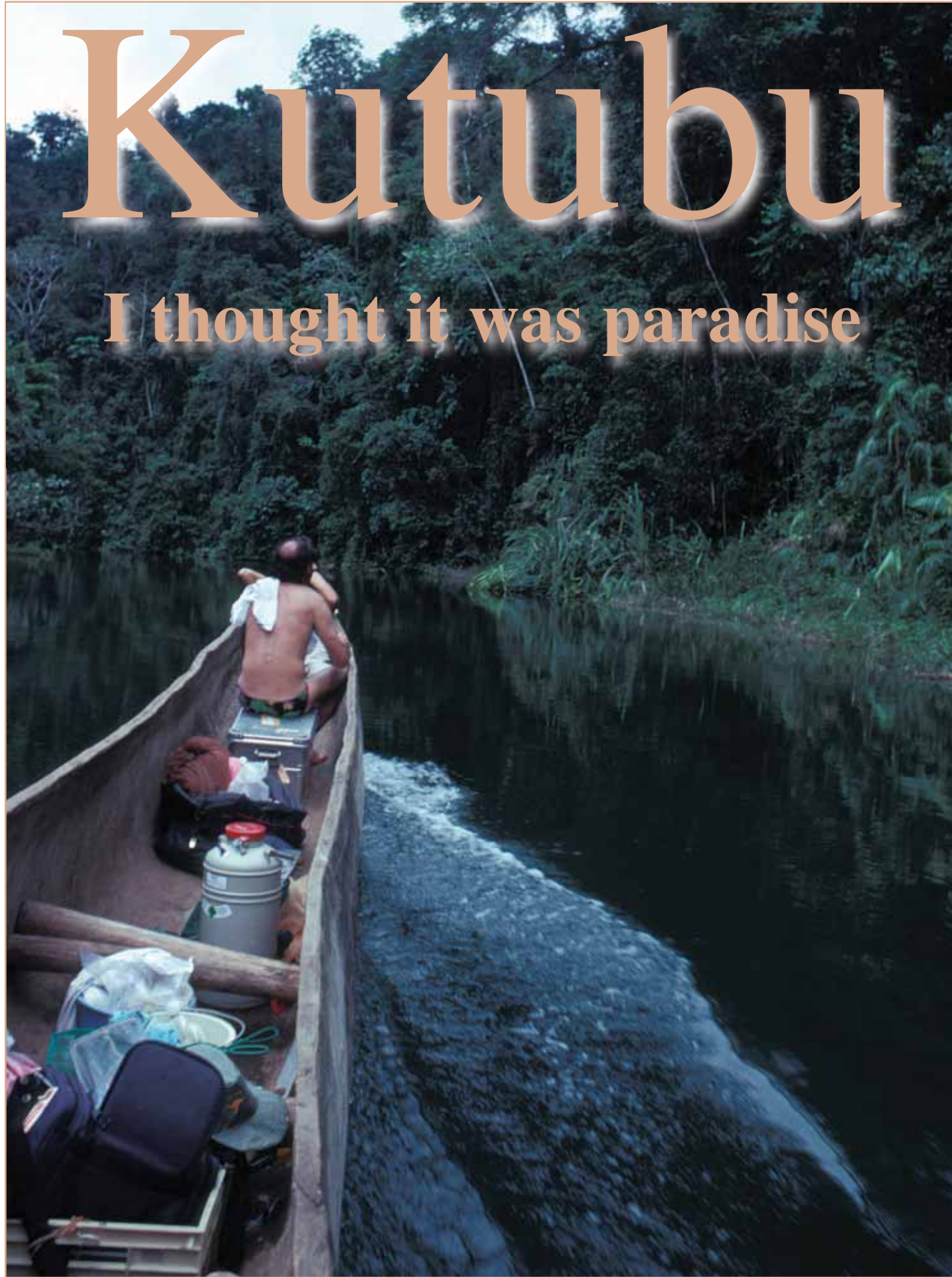
# Kutubu

Lake Kutubu is a crystal clear lake in the Southern Highlands province of Papua New Guinea. It is the largest upland lake of Papua New Guinea with an area of 49.24 km<sup>2</sup>, while its total catchment area is 250 km<sup>2</sup>. The lake is a dream, almost unique on planet Earth, but this dream lake is threatened...

Text and Fotos by Heiko Bleher & Natasha Khardina

# Kutubu

I thought it was paradise



The sharp cry of the Raggiana bird of paradise woke me up. The sun had not quite risen, but a beautiful silver-gray fog mirrored the surface of Lake Kutubu. This second largest lake of Papua New Guinea lies in the foothills of the Southern Highlands province, 800 metres above sea level. This unspoiled, magnificent lake reflects the serene beauty of the surrounding rugged terrain. It had not been seen by civilized men until October 18, 1936.

The tranquillity of the valley was broken this morning by the splash of a Wasemi tribesman's paddle as he rowed out in his dugout to catch crawfish with his hands. The damp morning fog rose slowly upwards over hundreds of sago palm trees. I took in this scene from Tage, an elevated spot at the northwest end of the 19-kilometre long, 4-kilometre wide lake. There we had spent the night in a small (one-room) hut built by the Foi tribe. Except for the mosquito screen and mattresses, it was constructed entirely out of primitive, jungle-grown materials.

As I stepped out onto the narrow porch, I recalled explorer Ivan Champion's words upon his first setting foot here: "With green wooded shores and islands, with blue water like the sea because of its great depth, and pleasant climate owing to its altitude of 260 feet, I thought it was Paradise!" The view was astounding... and it is still a paradise!

I ran down the hill to the shore to brush my teeth and to have another look at those unbelievable rainbowfish, *Melanotaenia lacustris*. Described by Murno in 1964, this fish belongs to a complex of highland-dwelling rainbowfishes, which also includes *M. herbert-axelrodi*, *M. monticola*, *M. kamaka* and *M. lakamora*. The fish is endemic to Lake Kutubu, into which no major river flows. There is only one outlet – the Soro River, which flows into the Kikori River – but *Melanotaenia lacustris* doesn't seem to follow it.

To reach this remote lake one has to first fly with Air Niugini (top) to its capital city Port Moresby and from there with a smaller aircraft to the Highland village Mendi (centre). Mendi which is built in a lush valley between impressive limestone peaks. It has essential services and its Hula tribes people even modern play cricket here (right).





The first sunrays softly penetrated the transparent water and illuminated these graceful fish, just like an infinite amount of aquamarine magnificently refracted by the gentle light. These precious stones have fascinated me ever since my childhood in Brazil. Especially when diamond-cut, their shiny, sparkling blue colours are comparable to those of this rainbowfish. With each ripple of water, a different blue-green-gold reflection shone; from every angle a different colour sparkled.

Only five days earlier I had a delicious dinner prepared by Connie and Pim, the wives of Dr. Gerald R. Allen and Horst Kipper. We sat in Horst's secluded hide-away about 40 kilometres south of Perth in Western Australia. Jerry showed me a photo of a rainbowfish taken by Neil Armstrong. My interest stirred, I decided to extend my business trip and go search for this unique fish. So (at midnight and with high hopes), I was off to see Neil, 4000 km east in Melbourne. I arrived later that morning.

Neil is a very dear friend and a fish enthusiast par excellence! He is an expert on Australia and New Guinean fishes. He devotes himself to the study of them (when he isn't standing behind the press of Melbourne's largest newspaper or listening to Schubert or Mozart on his incredible hi-fi). Not only does Neil know which creek, river, lake, or shore the various colour forms come from, he also knows who discovered them and much of their history. His fish memory is like a computer: he is able to recall every known fact.

Neil also breeds fish in his backyard greenhouse among beautifully cared for *Echinodorus osiris*, *E. bleherae*, and other plants. These he received many years ago from my mother when imports to Australia were still allowed. But of the few *M. lacustris* given to Neil by Jerry, only one female survived, due to

Huli, Duna and other tribes people from this area are famous for their red and yellow face decorations and elaborately decorated wigs. They care very much to conserve their old traditions. Women always carry their young around (top) or take them to wherever they go and continuously work, besides taking care of the house and the construction, carry the crop to the distant daily they still wave their colourful carrying bags (centre). While the man hunt or take care of their pets (left). The Papuas are extreme animal friendly.

a mishap, which was not Neil's fault. He showed me some sharp, perfect colour slides of this unique rainbow. I couldn't wait to start searching for them!

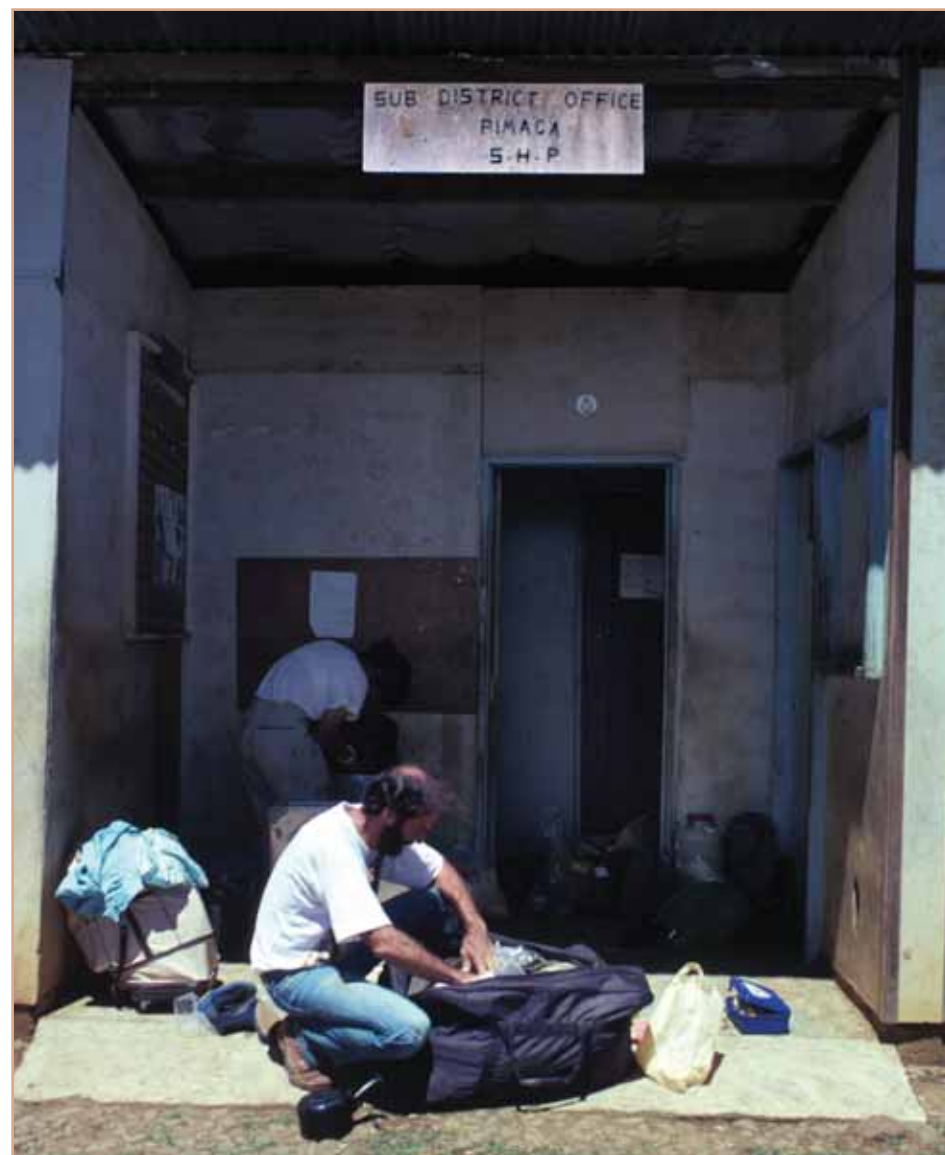
Early next morning he drove me to Melbourne on his way to work. Together with ichthyologist Pat Clark, I caught a flight to Cairns and connected with Air Nugini to Port Moresby. Previously I had searched for a seine, jungle equipment, and fish medication. The latter was obtained with much ado from a local vet. In Port Moresby I visited the lively, colourful Koki market. I am lured to this place each time I come, to the fantastic displays of fishes and native fruit. Unfortunately, rapid growth in this area has brought tremendous changes; old traditions disappear and are replaced by modern practices. It had been over two years since I had visited this port on the world's second largest island (after Greenland) and I was shocked by the change, the so-called "progress".

The Bandeirante aircraft, made in Brazil for Talair, departed punctually at 7:45 AM for Mendi. We flew over the rocky southern coast, then northward across dense jungle. We swept over rivers, mountains, and waterfalls, stopped in Tari and at 9:30 we reached the gateway to the southern highlands.

A chartered plane waited for us in Mendi. I had telephoned earlier to confirm this arrangement. (Surprisingly, the phone – usually unreliable in Papua – actually worked!) The pilot, Peter, was a native Australian. Before making the final approach at 11:30 at the tiny Pimaga airstrip, he circled to give me a glimpse of my destination: the legendary Lake Kutubu. The airport manager (who also runs the only bank and store in town) welcomed us. He also persuaded Peter to take some stranded passengers back on the return flight

From Mendi the only way to reach lake Kutubu is by charter flight. In both occasions of my visits I chartered a small missionary Cessna plane (top), which dropped me at Pimaga, the nearest village with a landing strip. Flying over dense Jungle high up one can only see once in a while below remote native village, in a world for itself (centre). The landing strip of Pimaga, built by the local tribes people for the missionary plane came in sight after an hours flight (right).





otherwise they would have to make a four-week walk! Then Peter was off, leaving us with the promise that he would return in three days at 9:30 AM. It seemed that the entire population of Pimaga awaited us. Visit from foreigners are a rare thing here especially "out of the blue!"

We soon found that Phillip, a real character, ran the show in this town. He owns the only existing vehicle: a tiny bright yellow Suzuki. He said, "If I get fuel, I'll drive you to Kutubu". With his know-how and high I.Q. on our side, we were soon on our way down the narrow, twisting jungle track at an average speed of over 120 km/hr! Others had told us that we could expect to lose a tire or doors along the way, but we arrived two hours later with the car intact. Our own bodies, however, suffered from bumps and bruises. Geseke is the name of the tiny village where we arrived. It lies on the eastern end of the lake. It consists of three huts, and old tractor (in disrepair for many years) and a few long dugouts that each measured up to 25 metres.

While Pat and Phillip were unloading, I rushed down to the shore to where a small spring trickled into the transparent lake. I threw some cereal onto the surface and immediately hundreds of fantastically colourful fish were attracted. My heart stopped for the second time in

my life (the first was when I had a heart attack in 1975). And after finding the incredible *Melanotaenia boesemani* in 1983, I didn't dream of finding a possibly even more beautiful fish. Yet there I stood before a gold mine. Pizarro couldn't have felt more excited when he stood in front of Atahualpa's ransom room, filled with more than 24 tons of gold.

There were innumerable fish, each with a luminous gold stripe running from the mouth over the back into the dorsal fin. Steel-blue-coloured bodies turning sometimes into navy and cobalt, greenish colours that faded to forest green and chartreuse, flashes of bright yellow and white, along with blood-red and rose tints. A rainbowfish as tremendous as this certainly never existed! The creatures swam gracefully in small and large groups. It seemed that they had taken possession of the lake; few other fish appeared.

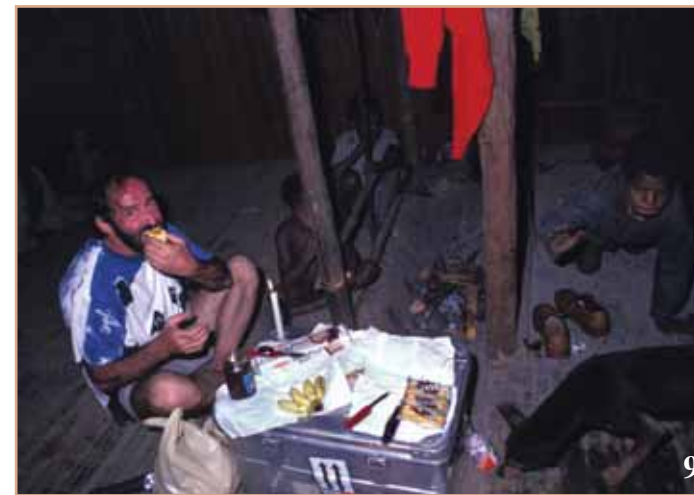
Asisi, a Wasemi tribesman, took us on a two-hour boat ride from Geseke to the other end of the lake where Kutubu Lodge is located. He rowed along the dense, rocky shoreline and past two large islands. Tage is the name of the spot where the lodge rests. From 1949 to 1951, Tage was the site of an old police station. Back then they conducted regular Catalina landings at Tage. The fantastic view of Kutubu and Wasemi Island makes it easy to see why this location was chosen. The area surrounding Tage is unbelievably beautiful. The Garden of Eden must have looked like this...

The lodge (built in 1985) consists of four huts and a long house. Olivier and Honor (Adam and Eve?) welcomed us. Olivier Meric is from Limoge, France. He came to Tage as a volunteer to help the Foi people build the lodge. Honor Gay is a botanist working for Oxford University. At the time, she was studying insects in the Lake Kutubu region. She prepared a delicious potato pie dinner for us in almost total darkness on our first night there. Afterwards I slept, completely content, knowing that I had finally discovered Paradise.

Here I was, daydreaming with the toothbrush in my hand (the paste had dried up), when I realized that Pat had joined me to admire the jewel-like fish.



The tiny "airport house" at Pimaga has no personal (1). But locals come to the small plane with curiosity, as such an event is very rare. We packed up and started to walk the nearly 40 km to the shores of lake Kutubu. Fortunately I always found some one in Pimaga to help to carry the heavy equipment (2). Along this walk we came across members of the Fasu tribe (3). It is a long walk crossing many small creeks where the primitive bridges are always washed away (4), but over some larger creeks the Fasu built a palm-leave roofs and they stand up (5). Along the walking path we always came by Fasu houses (6).



To see an old man like this Fasu (1), is extreme rare, their live expectancy is normally below 40 years of age. Although all of the hardly 50 known bird of paradise species are protected, they are still hunted by locals and offered to tourists, even in this remote region (2). Birds of paradise are endemic to New Guinea and some its surrounding islands. The Fasu tribe people are wide spread in the Kikori river catchment and living in remote tiny villages, therefore the children are very shy (3-6). Most of them have hardly ever seen a white man. It rains almost every day in the Southern Highlands and we were very happy when it started again coming down in buckets, that we were invited to a man's Longhouse (12). Every man in such a 71 m long Longhouse has his "bed" and one was given to me and also part of their food (9). They prepared it especially for me (7). But what looked terrible, like blood mixed with some thing else, which was sago (10), is actually delicious. The red paste is made from the flower of the local Pandanus tree (8). It rained for hours and the small boy trying to join us slit again and gain down hill (13-14). These Longhouses have no window, the only opening at each side of the 71 meter is a door (11).



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The only outlet of the 800 m high Lake Kutubu is the Kikori River. It rains almost daily in this region and even under tormenting rain at one of my expedition, were Gerald R. Allen came along, the famous ichthyologist who publishes regular in our *aqua*, *International Journal of Ichthyology* and who has done several field trips with me, did not mind to catch fishes with me (1). During that expedition we went up and down the Kikori river to do further research (2). The Fas

and also the Foe, which live around Lake Kutubu, have as their only way of transport always a dugout made from a single tree (3). At the southern end of the lake, where the track ends, is a small Foe settlement and from here one has to access the lake Kutubu by boat, there is no other way (4). On this journey besides Allen also the Belgian, Monique Nicolai, came along. But once we reached the open lake it started to rain again very heavy, everything in the boat got wet...



1



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4

The Foe, who live in 12 villages around the lake, consist of about 2,500 people. The villages are principally sago subsistence agriculturist, with sago providing 75% of their food volume. Their hoses are all made of traditional materials (1-2). In one part of the lake, where it has its greatest depth of 70 m a high rock formation (3) emerges from the water. The Foe have carved places into this rock where they lay their ancestors. They expose them to the lake-side, cranium next to cranium and bones standing up against the wall, for every man or woman who paddles along is able to see his ancestor (4). The local people have also built a nice lodge (5) to allow visitors to observe traditional life in comfortable surroundings, which is constructed of bush materials. Butterflies (6-7) and Birds of Paradise are common in this area. The view is dream-like (8) and the lakes shore edged by incredible vegetation and many aquatic plants (9).



5



6



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At 7:00 AM we had just finished our breakfast of *uki* (breadfruit) and banana, when Asisi arrived to take us around the lake.

I will never forget the following two days. No place on earth could be more peaceful, or colourful, than here. If I wrote down everything I observed, it would fill a book. I can only relate a few of the highlights of our stay.

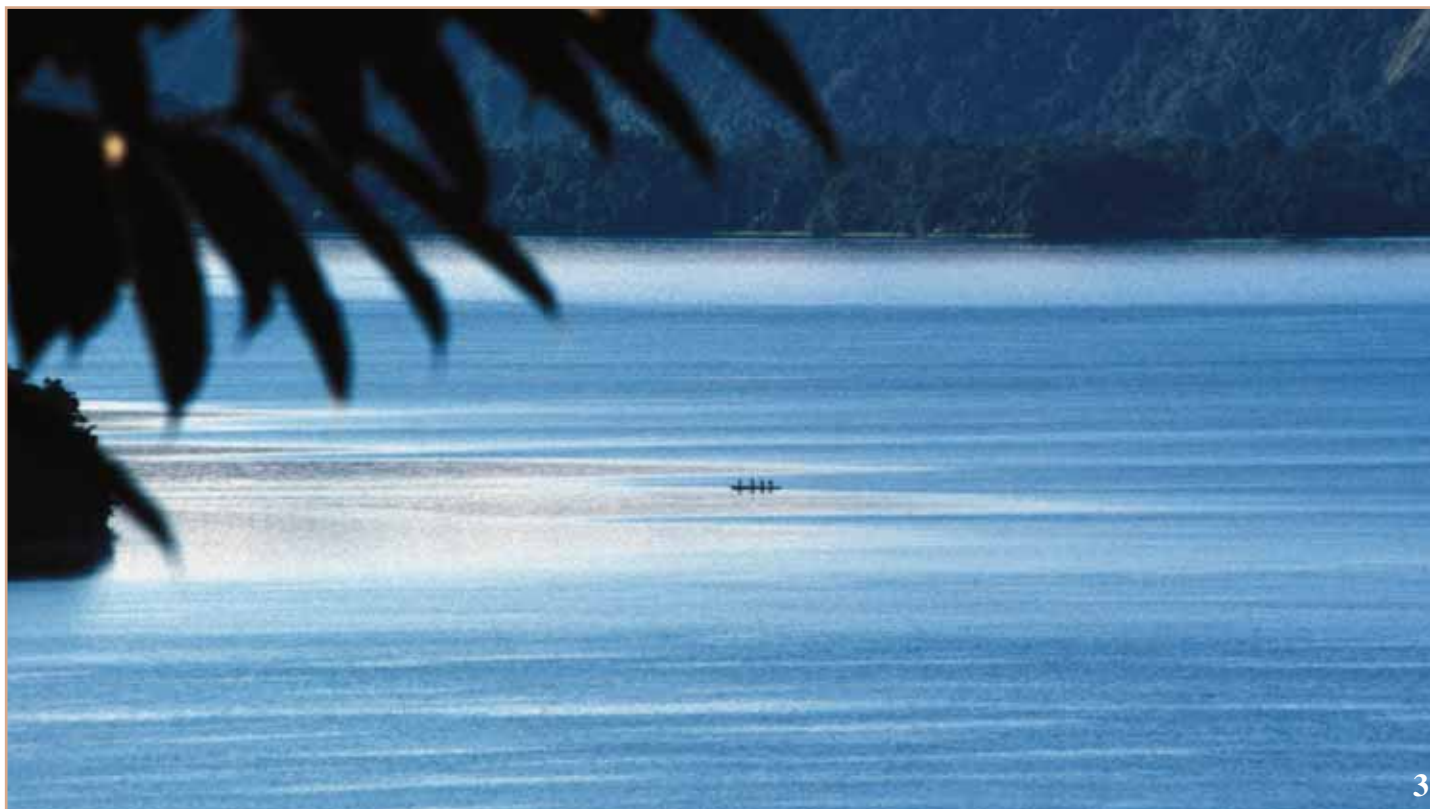
Lake Kutubu is supplied with clear mountain water by subterranean sources and small creeks. I hiked up a few of the creek beds, which are of limestone covered with soft green ferns. I climbed over them, past gorgeous orchids and *abari* (the spiny *Pandanus* with a dark red flower). These brooks generally end after a short distance, in forest or rocky terrain. Here, near the lake, grew bamboo trees of formidable size and the famous *Camptosperma brevipetiolata* trees. Natives tap tigasso oil from the latter and sell it do highlanders, who rub it on their bodies to make themselves look attractive for ritual songfests. Aquatic plants grew everywhere, as deep as 7 metres below the surface. The richness in plant variety included *Ceratophyllum demersum*, *Ottelia alismoides*, *Limnophila indica*, *Hydrilla verticillata*, *Potamogeton pusillus*, millions of *Nitella pseudoflabellata*, the tiny white flowering *Polygonum attenuatum*, blood-red giant *Vallisneria* species, and a gorgeous *Blyxa*.



8



9



Early in the morning, before sunrise they Foe paddle into the lake, which in most places is hardly 3-4 m deep, to catch the abundant crayfish, their only source of protein (they do not eat the fishes here). The fog over the lake rises slowly in the early morning and the peace one inhales here is just not to believe...

... this to me is paradise. I do not believe there is anything similar on planet Earth, such beautiful surroundings, untouched nature and native tribes living their ancient traditions and culture for millenniums, and a priceless peace.





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There are 14 species of freshwater fishes in the lake, but only one rainbowfish species, *Melanotaenia lacustris*. This fantastic fish I was able to collect for the first time alive many years ago (1). Today this is one of the favourite rainbowfishes in the hobby around the world and all came from the few specimens I brought back alive... Its amazing colours can vary very much, from steel blue (2) to an

The fish fauna consists of only 12 species, including six eleotrids, a plotosid (*Oloplotosus toboro*), an atherinid (*Craterocephalus lacustris*), a theraponid (*Hephaestus adamsoni*), 8 gobiids (*Glossogobius* and *Mogurnda* spp.) and the only melanotaeniid: *Melanotaenia lacustris*. All, except of an eleotrid (*Oxyleotris fimbriata*) and the introduced mosquitofish (*Gambusia affinis*), appear to be endemic. The water temperature in the lake went from 26.0°C. (Highest during midday at the shore) to 21.4°C (at midnight). The pH of the lake varied from 8.7 to 9, except for one low of 7.8 measured near a merging creek.

While there I also visited the amazing Wasemi tribes people. They live just as their ancestors did centuries ago. I was welcomed by the chief (it took me some time to teach him the Western custom of handshaking!) in front of the traditional 213-foot-long, 16-foot-high longhouse for the men. With Asisi translating, he explained to me the social roles of males and females here. There is a marked segregation of the sexes. The women have separate house, called a *kanya*.

I was shown the gardens where the women cultivate a large variety of plants. Two kinds of yams – *yatafa* and *hogo* – are grown, as well as four types of cabbage: *gagana*, *harase*, *garubaio*, and *sagai*. The main vegetable is *anumu*, a cucumber. Also cultivated are sago palm trees, the leaves of which are used to weave the beautiful roof, wall, and mattress designs of the Wasemi people.

As for the fish, well... I thought it would be no problem to wait until the end of our two-day stay to collect them, because of the abundance. That was a mistake!

The afternoon and evening of our last day, I tried to seine them with Pat's help, but they outsmarted us all the time. Due to the clarity of the water, they saw us and always swam out of the net before it was ashore... Finally, when I used the methods adopted during my Brunei expedition (see *TFH*, May 1987), I was lucky. Standing on the rocky bottom in 1.5 meter deep water, I dipped my hand net and spit ghastly biscuit bits at short intervals on the water surface. They sunk under water into a foot-square net opening and the rainbowfish went after it! Late that night I had a few, but my body

became chilled standing for hours in the water and Pat was tired holding the plastic bag. What a situation: millions of fish around and hardly one in the net...

The following four days were an adventure from a comic book. During the long boat ride in the early morning back to Geseke I packed the precious fish in an old rotten suitcase, for which I had paid \$150 at Koki market. Although I had a permit I wanted to avoid problems at customs when leaving the country and I thought nobody would pay attention to a piece of luggage such as this. Philip, who had promised to pick us up and bring us in time to our chartered plane, arrived two hours late at Geseke. He had run out of fuel. When we finally reached Pimaga, we only saw the tail of our aircraft. This made us miss the connecting flight to mount Hagen, from where the next day (a Sunday) the only commercial flight at 1:00 PM would leave for Port Moresby, connecting with the weekly flight, we were stuck for an entire week and the fish, too... Which meant they would probably die.

Pimaga's radio broke down just after we finally had contact with the airline charter office in Mendi. It was 12 noon and closed for the weekend. They didn't have radio contact again until 7:00 PM. While we sat in the grass in front of the old wooden mission-hut waiting, giant leeches attacked us in masses. I had only seen large leeches like this in Myanmar (Burma) before, but there they live in the water of the Inle Lake.

At 7:00 PM sharp, the radio came on the air and I talked to the mission on Mt. Hagen. After explaining the situation, with interruptions every 3 seconds, they said: "Unfortunately our religion doesn't permit us to fly on Sundays! The seventh day is a day to rest..." Now, I really had a problem; I knew my fish couldn't read the Bible and they would die. How would I explain it to them? Knowing that the communication would be cut off any second, I just screamed – half crying, full of anger and disappointment – for them to contact any local charter company or pilot to send us a plane early next morning, at any cost! The radio suddenly went dead. I didn't even know if they received the message and we couldn't get any new communication. I stayed



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emerald green (3) it can turn to green and blue, silvery below (4), or completely dark blue in seconds later (5) and even into other colours. In the aquarium (6), while opening its mouth it can be very light coloured with a yellow golden stripe and light green above.



The lake's extraordinary level of endemism (10 of the 14 fish species found there are endemic to the lake itself) exceeds that of any other lake in the entire New Guinea-Australian region. The endemic species, besides the rainbowfish species, which is the only one found in the lake, include gobies, Atherinids and one catfish, and some of those I want to show here: There are 9 different gobiids, a speciation of that group of fishes unknown to any other lake in the world. There is the Lake Kutubu mogurnda (*Mogurnda kutubensis*), which changes its colour pattern from baby (1) to semi-adult (2-3) and once it has reached about 25 cm in length it turns yet black (not shown). The blotched mogurnda (*Mogurnda spilota*) is a beauty (4), as well as variegated mogurnda (*Mogurnda variegata*) (5) and both of those stay small, hardly 7 cm in TL. Also the only *Glossolepis* species in the lake (6) does not grow larger and its males have the bump, which normally found in some of the American and African cichlids (inserted photo).

The largest fish in the lake is the predatory and not endemic gobiid: *Oxyeleotris fimbriatus* (7). It may grow to over 30 cm TL and is wide distributed in New Guinea. It can walk over land and survive in extreme habitats. The only hardy head in the lake is again endemic, the so called Kutubu hardyhead (*Craterocephalus lacustris*) (8). This species has been photographed here for the first time, as we had not found it before, it lives in the open water over the deepest part of the lake. Also the Adamson's grunter (*Hephaestus adamsoni*), lives in deeper waters. I call these, the Australasian *Hephaestus*, the cichlids of the fifth continent (as there are no cichlids in Asia besides in India, and none on Australasia). Here a juvenile and an adult (9-10). There was also, on one of the expedition, the aim I had to collect for the first time alive the highest rainbowfish, *Melanoatenia monticola* (12). While in Mendi waiting for some days for the charter plane to Pimaga, I went to mountain stream over 1,800 m high and was able to collect it. Together with an unidentified juvenile gobiid (11).

awake all night I couldn't sleep after the sago palm-meat dinner. It looks like white marshmallow and is totally tasteless, but is the main food source of all locals. How they survive on it is a mystery to me. At 10:00 AM we figured everything was in vain. It takes 2½ hours to fly to Mt. Hagen and Air Nuguini's departure to Port Moresby was at 1:00 PM! Then we saw a Cessna 172 on the horizon.

The next shock was flying at 3000 meters high. The small aircraft had no pressurization. The top of my suitcase lifted and all my fish bags burst! Picture this: rainbows all over the rear end of the plane, jumping around, and me in the middle trying to catch them for the second time! I was thrown from one side to the other while the pilot fought the terrible turbulence in these high mountains.

With almost no water in the repackaged bags, we landed at Mt. Hagen, 15 minutes before Air Nuguini's scheduled departure to Port Moresby. Adding mountain water to the fish and getting a bite (we were both starved), we almost didn't make it after all. When I saw the Boeing 737 blowing the turbines at full power and doors closed, I just threw myself with my fish-suitcase in front of the aircraft and forced the captain to stop. While he lowered the emergency stairs, he screamed out of his window all known and unknown names and during the flight he gave me a lecture on coming late... what did he know?!

After fights with customs in Port Moresby (150 kinga – over \$150 – more or less didn't bother me), the chartered flight was \$1,600 one way, the total cost was already more than \$15,000

to collect these jewels, we flew that evening to Cairns, where the Australian customs insisted (at midnight) that we destroy the fish. No live animal or any animal product is allowed into the country, not even in transit! It didn't help to explain that *Melanotaenia* is a genus common to Australia nor that I had asked (prior to my expedition in Canberra, the capital, and at the Queensland Museum in Brisbane) Roly McCay, ichthyologist and the authority, to bring a few fish in transit. Customs people were stubborn. At 3:00 AM, after getting the responsible people in Canberra out of bed, I had a 48-hour transit permit. At 6:00 AM, I left for Melbourne, so did the fish-suitcase sealed with lead. A special quarantine vehicle and a crew in white awaited the "dangerous" load at the other end the same evening. Plutoni-



1

On one of the expedition, while photographing the beauties from the lake, I had a constant visitor: a hornbill. He watched me and was eager to get some of my bananas all the time (1-2). Hornbills are found from Africa throughout many parts of Oceania and are very peaceful beautiful birds. On the trip to Lake Kutubu with Gerald R. Allen, we had luck and there was a tiny jeep in Pimaga who took us the 40 km to the lake (3). But on the way back there was no further go as a bridge had collapsed and we headed back by boat on the Kikori (4). On the chartered flight, because the small aircraft had to go over 3000 m high my plastic bags busted and the rainbowfishes were swimming on the floor of the Cessna (5). And I had to do another Lake Kutubu journey, but without regret, as it is paradise...

um couldn't be handled more carefully! Special staff watched me in the totally disinfected area during my water change and re-oxygenation of the fish. They gave me special containers, and any used plastic bags, rubber band, and water were destroyed immediately. I had to disinfect myself before and after I entered the station. Totally exhausted, I was hosted by dear Neil late that night and finally the net day I was heading back to Germany.

Twenty-nine hours later at Frankfurt

airport, they couldn't find the fish. Qantas' cargo department said they had never embarked in Melbourne! I made several long distance calls to Australia. I asked Neil and Rick to help, called the quarantine station, but nobody knew where they had disappeared! After all of this trouble I couldn't believe it. When I was about to give up, the suitcase was found in London! Most of the 67 *Melanotaenia lacustris* had survived!

I slept for 16 hours after this shock,

while my jewels started to thrive in my home aquarium where some of the original wild fish still live happily today. In the meantime this fantastically colourful fish has conquered the world. Now there is another incredibly beautiful rainbowfish for the joy of everybody, one more in the line of many (almost all) melanotaeniids and pseudomugilids I have introduced to this, the most beautiful and educational hobby in the world... And some more to come...



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3

Two biotope aquariums from New Guinea on these two pages.

1. One authentic biotope for rainbowfishes from lake Kali Biru in Iraitan Jaya (also called West Papua or Papua Barat today). The Kali Biru is actually a very small lake situated in the middle of nowhere and only accessible by walking. When I first visited it in 1999 I was able to catch this beautiful rainbowfish for the first time, which was described two years later by G. R. Allen as *Glossolepis doryti* (2). I had called it the red zigzag rainbowfish. The lake is very deep (it is a karst and its water comes from deep underground powerful up to its surface) and immediately at its edge already drops deep down, no place to enter except for swimming and diving. And unfortunately on my first trip I was only able to catch males (which I found out later, being a new species...).

So I had to return. The first collecting was extremely difficult so I wanted to be smarter the second time. Finally with a gill net of 50 m length and 6 m deep, I got after hours among hundreds of fallen in trees 5 specimens (3). But only one was a female. Anyway it made it possible to bring back alive and breed it, and all those today in the hobby are from that second attempt.

The decoration should be similar to its habitat (1) being: Fishes in a 200 l aquarium (the shown one has 400 l) about 40 *G. doryti* and 20 *Chilatherina fasciata* "orange" which are also found in this lake and available in the hobby as well. The decoration consisting of medium sized light coloured gravel, some sandy area, drift wood (plenty) and red lava or karst stones (or both).

For aquatic plants only *Microsorium pteropus* are growing here. One can add some floating plants, as *Pistia* or *Salvinia* species. As for the water parameters these are not sensitive fishes and used to hard water, pH can be over 8 (anywhere from 7.0 to 9.0), and the conductivity 300  $\mu\text{S}/\text{cm}$  or more and the temperature from 22 to 28°C. A normal external biological filter is suggested.



4

4. Biotope also Lake Ifanten, is a relatively small lake, but contrary to Kali Biru it is surrounded only by high grass and not a single tree (6). This second rainbowfish biotope I want to suggest to you, is for my so-called millennium rainbowfish, because I discovered together with Natasha, in 2001, at the begin of our new millennium and also because it has the most striking red colours ever seen in a rainbowfish (5). For decades G. R. Allen and myself have tried to find *Glossolepis pseudoincisus*, without luck. We never found it at its type locality in the Tami River. But from many landings in Sentani, Irian Jaya, I had on several small charter flights located a high and remote lake and always wanted to do some research on it, but could never reach it. Until one day I found a Dani, who explained who to get there and during a days walk we reached it. The very first collected specimens looked pale and I thought nothing special, but took it along.

Within three months it became this bright red colour – unbelievable, but only the males. The biotope should consist as shown (4) of a group of these fishes (as besides a snakehead, nothing else lives in this former crater lake) according to your pocket.

But I suggest no less than 20, better 30 to enjoy. They are fantastic fishes for itself, although if one wants can always add some gobies and a other rainbowfish species.

For aquatic vegetation only *Nymphaea*, some grass-like aquatic vegetation (i.e. *Cyperus*), and *Microsorium* is to recommend. Decoration with lava stone and sand, maybe some rocks.

The water parameters vary, the pH from 7 to 8.5, the conductivity goes up to 300  $\mu\text{S}/\text{cm}$  and the temperatures from 21-30°C.

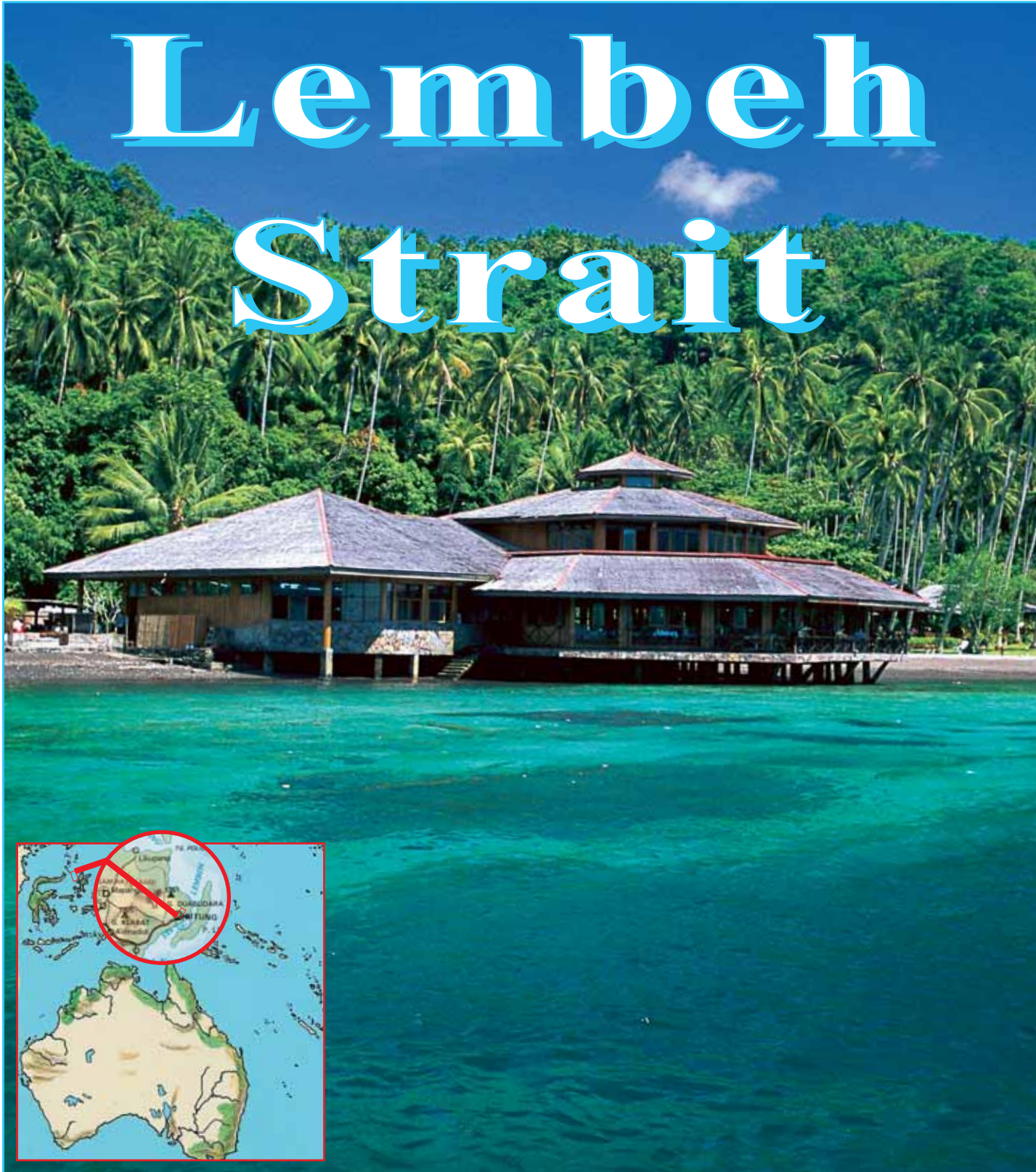


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# Lembeh Strait



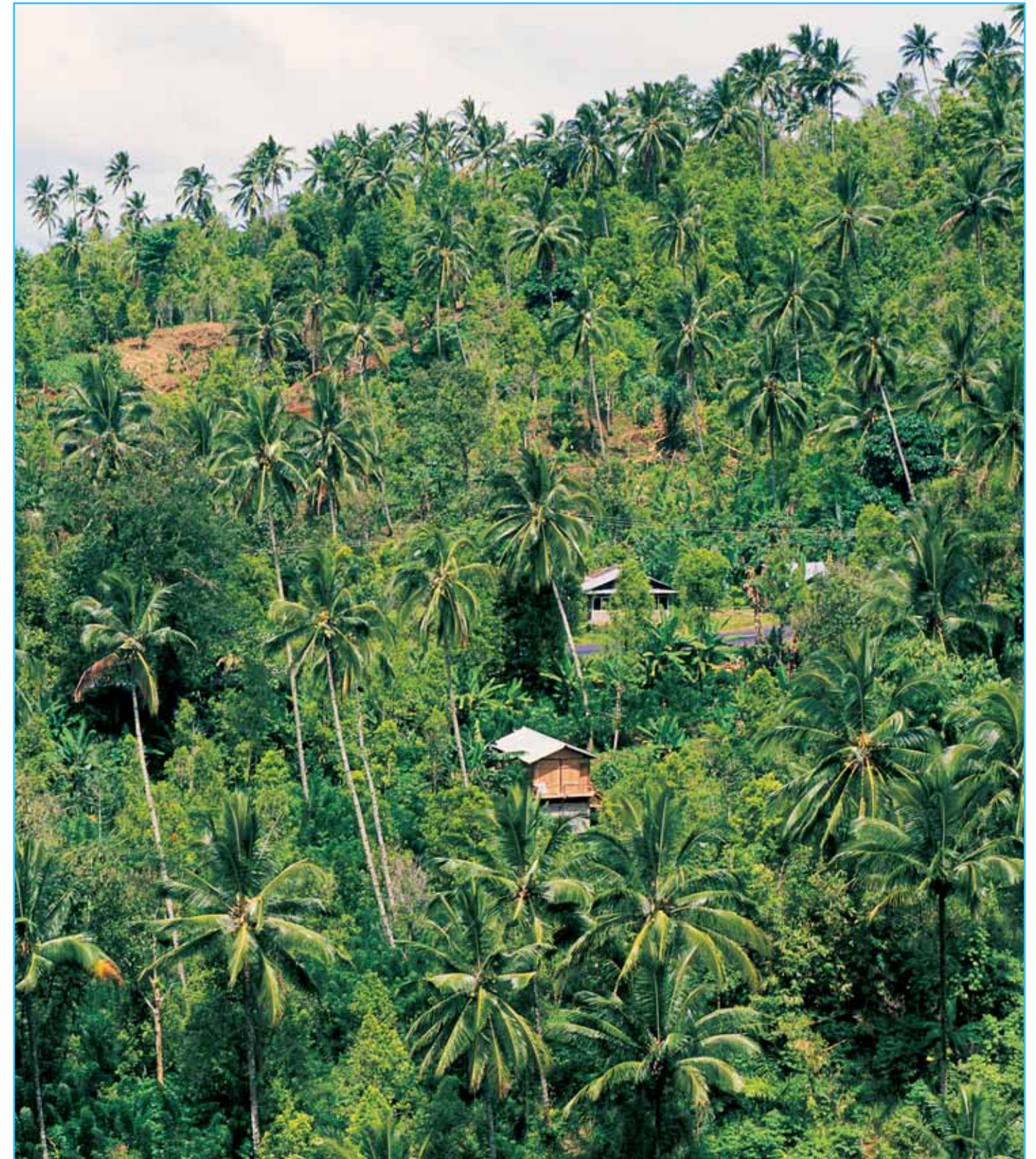
The Lembeh Strait, off the northern tip of Sulawesi (formerly Celebes), Indonesia, is very rich in aquatic life forms, and the abundance of life to be seen during a single dive is almost unbelievable. The Swiss Franco Banfi has researched the area to bring this exclusive report and breathtaking photographic essay.

Text: Franco Banfi and Aquapress - Photos: Franco Banfi

The Strait of Lembeh is the name given to the narrow passage, 16 km long and 2 km wide, between the northern tip of the Sulawesi mainland and the inhospitable mountainous island of Lembeh. The

waters that flow through the strait, between the Celebes (Sulawesi) and Molucca (Maluku) seas, carry huge concentrations of plankton that maintain the abundant and diverse marine life of the area. The nearby

town of Bitung, a natural harbour and the principal port of northern Sulawesi, imports everything from fuel to foodstuffs, and it is also the departure point for ships carrying local products such as oil and tinned tuna.



The mountains adjoining the Strait of Lembeh are cloaked with vegetation, with palms dominating.

The surrounding area is dotted with small coastal villages and coconut palm plantations. The volcanic crater of Mount Klabat dominates the town, and the surrounding roads are crowded with minibuses and horse- or bullock-drawn carts. The market area is filled with local fruit, vegetables, and spices, and the main fish market, situated to the north of the port, sells fish caught the night before, brought in fresh every morning.

Together the mountains of Lembeh and the coast guard the strait, forming a natural barrier that protects the area from the worst of the monsoon, from the north-west and south-east, and



making it possible to dive in the strait all year round, although the sea is calmest and the days sunniest in the months between May and October. Hence nearby Manado, the largest city in the northern "arm" of Sulawesi, attracts divers from all over the world, drawn to the strait by the splendid underwater precipices, the clear water, and the possibility of meeting with big fishes. In particular the fascination of the Lembeh Strait lies in its unusual marine inhabitants and the ease with which these can be seen; for example, there are harlequin ghost pipefishes (*Solenostomus paradoxus*), seahorses (*Hippocampus* spp.), batfishes (*Platax* sp.), dragonets (*Synchiropus* sp.), flying gurnard (*Dactyloptena orientalis*), and innumerable varieties of frogfishes (*Antennarius* spp.). The last of these

have developed the art of mimicry to perfection, imitating whatever surrounds them – corals, sponges, rocks, and tunicates – by changing colour. Members of the same species can exhibit completely different coloration to one another, and can change their colour in a few days to match a new "background". This behaviour is not a defence mechanism, but rather a system for avoiding being seen by their prey.

The prolific invertebrate life of the strait is likewise a delight to all who dive there. The variety of corals, sponges, and other creatures is extraordinary, as are their

interrelationships with each other and the fishes. For example, the crinoids are a haunt for shrimps and small crabs, elegant squat lobsters and gobies, which coordinate their colour to resemble their hosts as closely as possible. The tiny robust ghost pipefish (*Solenostomus cyanopterus*) is often seen in pairs, sheltering among gorgonians or amid the arms of crinoids. A number of different species of seahorse inhabit the strait: the common or spotted seahorse, which lives in shallow water, the thorny or spiny seahorse, which prefers deeper water, and the dwarf seahorse, which lives among some species of gorgonians. The last of these seahorses is very small and was discovered only accidentally in 1970, when a diver bringing a piece of gorgonian to the surface was amazed to find two minute sea horses attached to it. Soft corals and holothurians (sea cucumbers) play host to highly-coloured crabs, shrimps, and young fishes. More than 200 species of nudibranch have been reported in the Lembeh Strait, and it is not unusual to see many different species during a single dive.

As well as being a marvellous place for divers interested in these unique creatures and their habitat, the Lembeh Strait also has much to offer those attracted by large marine animals. Migrating whales and groups of manta



Sulawesi is the largest rice producer in Indonesia. Zebu and water buffalo are used to plough the muddy rice-paddies, just as they have for centuries.

rays (*Manta birostris*) enter the strait at least twice a year to feed on the abundant plankton that can be found there in April and September as a sideeffect of the monsoon season. From time to time divers may also encounter humphead or giant wrasse (*Cheilinus undulatus*), small sharks, and turtles. Shoals of tuskfishes sporadically appear in the diving areas, opening their mouths in unison to feed all together. The wrecks of three ships from the Second World War can also be visited in the depths of the strait.

The majority of dives take place in the northern part of the strait, in its narrowest section, as towards the centre of the channel strong currents exchange nutrients between the two seas that wash its two entrances. However, various dive sites are also to be found in more sheltered places, in the bays and curves along the coast. The area offers a great variety of habitats: small coral reefs, mangroves, sandy slopes and bays, and in such places it is possible to encounter most of the unusual creatures that the strait has to offer.

The most effective diving technique involves descending slowly, closely observing the terrain in the minutest detail. On the reef, the struggle for survival is so intense that some creatures readily change their form or colour, camouflaging themselves against their current background in order to avoid the gaze of predators. Their mimicry is so perfect that a quick glance at the reef does not reveal their presence. Only careful inspection at close quarters can reveal such delights as a tiny robust ghost pipefish mimicking a crinoid or a gorgonian, the tiny shrimps living symbiotically with a starfish, or the emperor shrimps living on the holothurians. Likewise the batfish (*Platax* sp.) may elude the onlooker's first glance, but closer observation will reveal two eyes observing the observer...

The Strait of Lembeh remains one of the most charming and least known places in southeast Asia. The area has become accessible to tourism only recently, but can easily be reached by car, crossing the peninsula from Manado to Bitung, a journey of only an

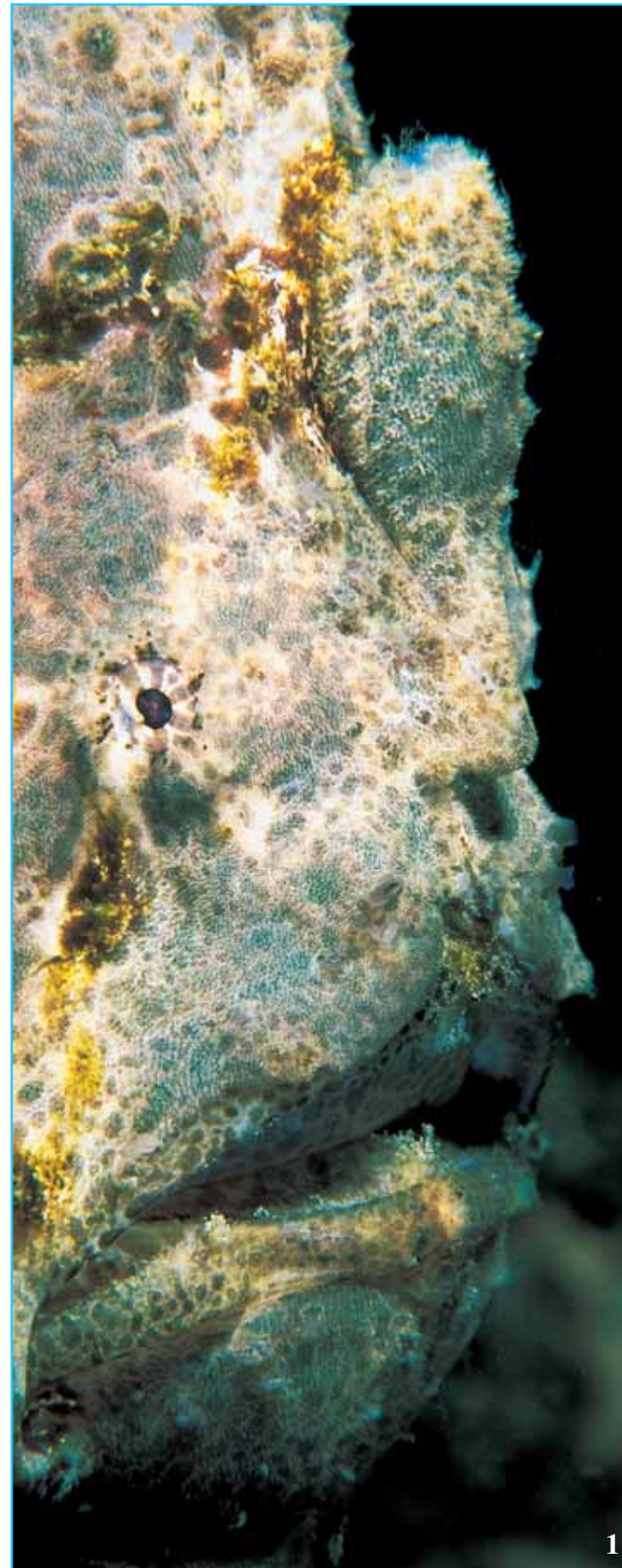
hour. As we have seen, the waters offshore are home to some of the most fascinating and unusual of sea creatures, from the great whales to the smallest and most fantastic fishes, and marine biologists believe that the area of sea between Sulawesi and Maluku in



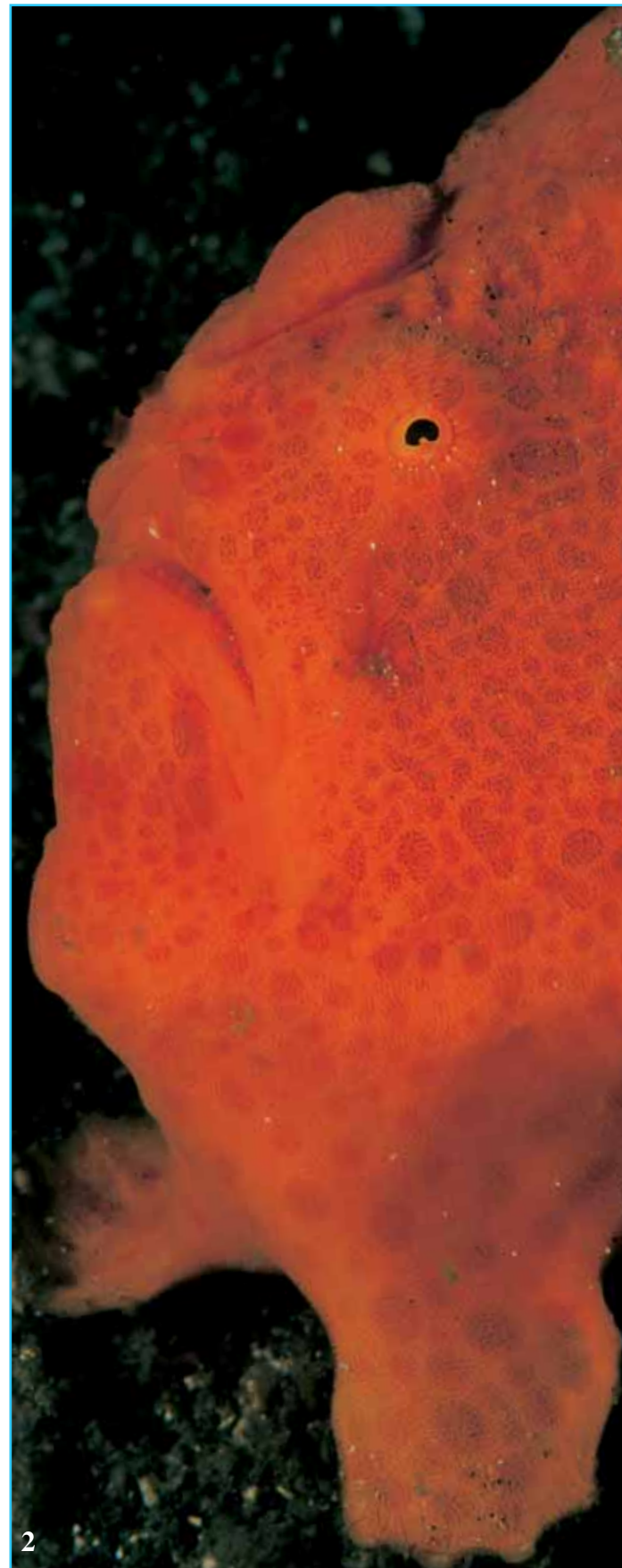
The fish market in Bitung.

Indonesia may have the greatest biological diversity on Earth – starting from this hypothetical centre, the number of different species decreases in every direction. An unspoiled marine paradise and a fauna quite beyond compare, above or below water!

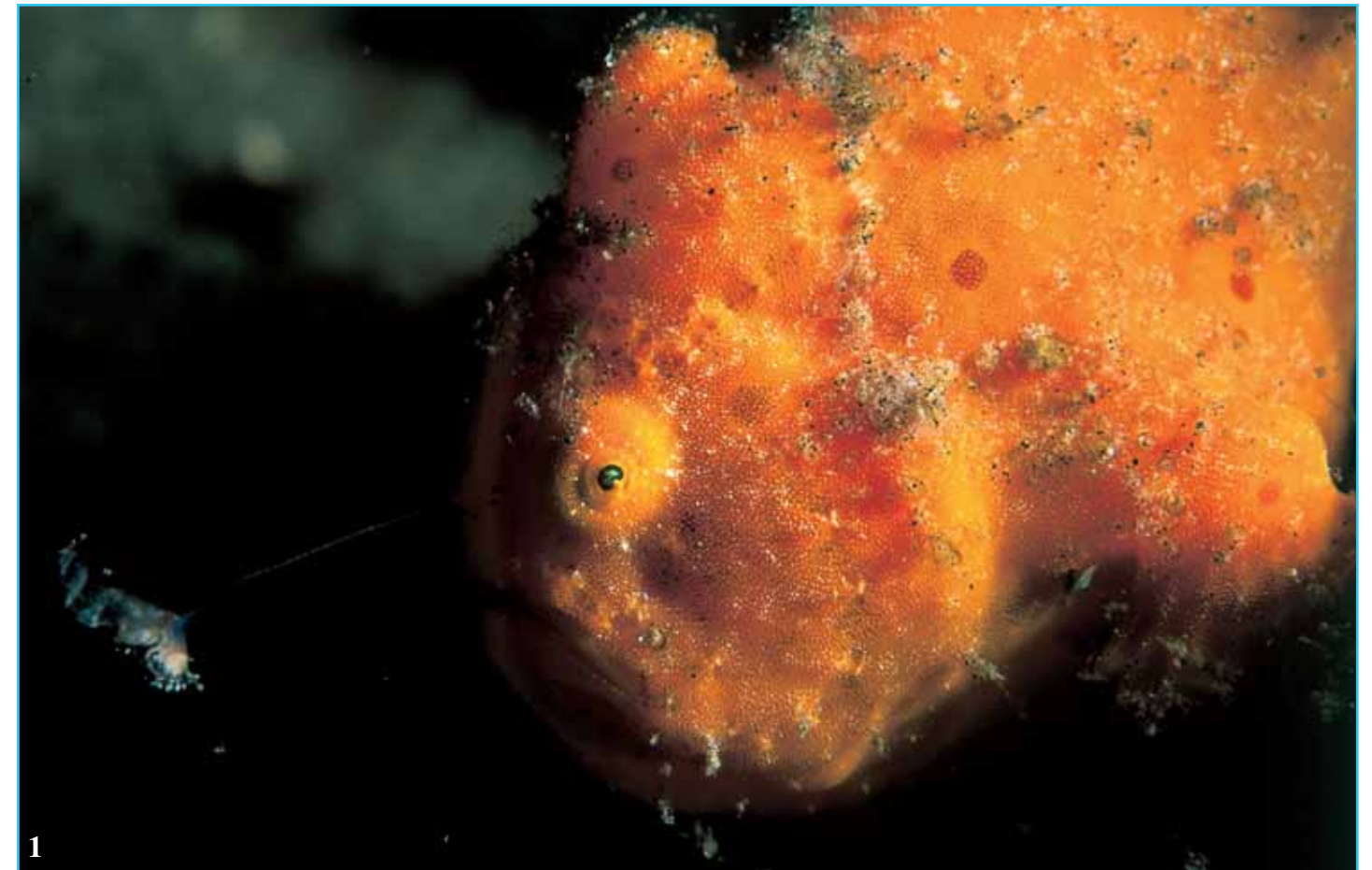




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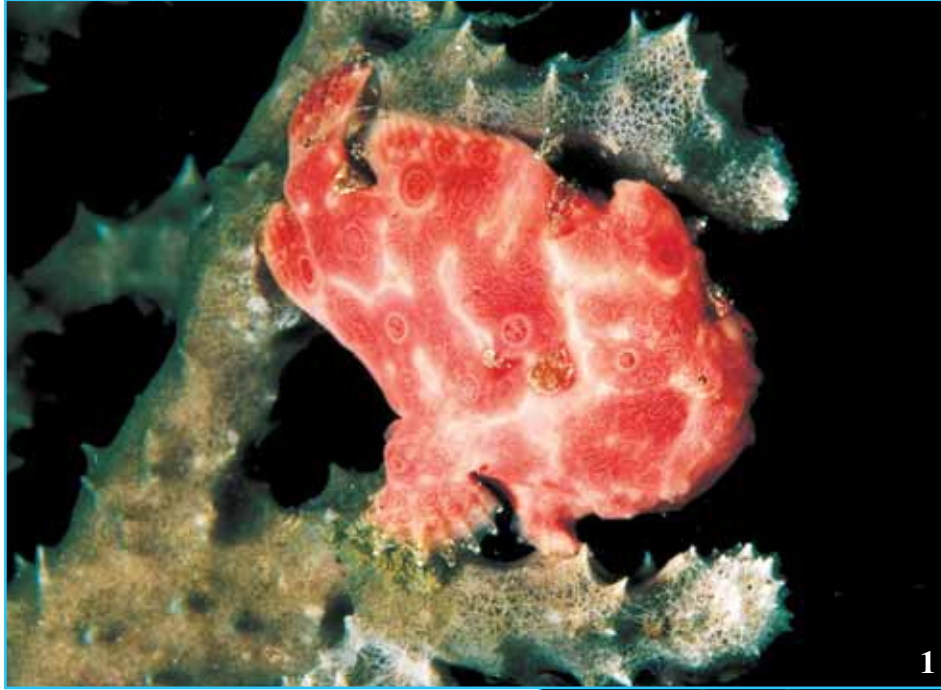
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Fishes with rod, line, and bait: the frogfishes of the Lembeh Strait

Above: Frogfishes are without doubt amongst the strangest creatures in the sea. Left: *Antennarius commersoni*, and right: *A. multiocellatus*.

Righthand page: Two frogfishes with different equipment. 1. *A. pictus*, with typical rod and line, the illicium and the esca (= bait), which the predator swings to and fro in order to attract its prey. 2. *A. dorehensis* has a different type of equipment, which looks rather like a worm but is actually the mobile anterior dorsal fin which all frogfishes use for their fishing. (More on the following pages.)





1

Fishes with rod, line, and bait:  
the frogfishes of the  
Lembah Strait

For they do indeed go fishing, and this is essential to their survival. Because they are strictly bottom-dwellers, barely able to swim. Nature has not only provided them with a capacity for camouflage almost unrivalled in the animal kingdom, but has also given almost all of the 41 species in the family (Antennariidae) up to two methods of attracting prey. One is the "rod and line" from which Man has learned, and is actually the first dorsal ray, the so-called illicium (from the Latin *illicere*, to decoy); it is mobile, often very long, and thin as a hair. Almost all illicia end in an esca (the Latin word for bait). A rod and line of this sort, complete with bait, can be seen in photo 1. (*Antennarius pictus*) on page before. It is difficult to imagine a more perfect rod, and line! The mobile anterior dorsal can,

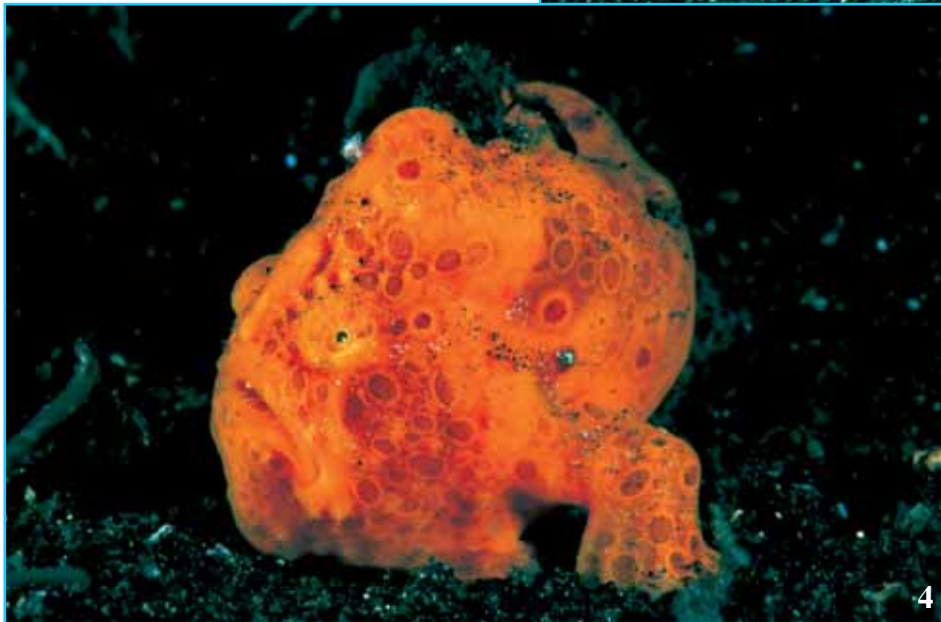
however, also resemble a worm or a fish fry. Photo 2 on page before (*A. dorehensis*) clearly shows such a wriggling worm. This type of lure can be far larger and covered in lower lifeforms (see 3, 5 & 6 on these pages). Frogfishes share a number of other features, including a somewhat vertically compressed body, elbowed pectoral fins which they use as props, and a large upward-directed mouth into which they can suck the victims of their deception in less than 6 milliseconds - no other predatory vertebrate is known to be capable of such speed. In addition all frogfishes can camouflage themselves, colourwise, in every environment imaginable. Here are just a few examples: photos 1-4&7-9,2&5 all show *Antennarius pictus*. Photo 6 is *A. maculatus* and photo 7 *A. striatus*, one of the weirdest. None of the individuals shown is more than 10 cm long; and while *A. commersoni* can attain up to 33 cm, the smallest species, *A. randalli*, is just 11-20.5 mm long!



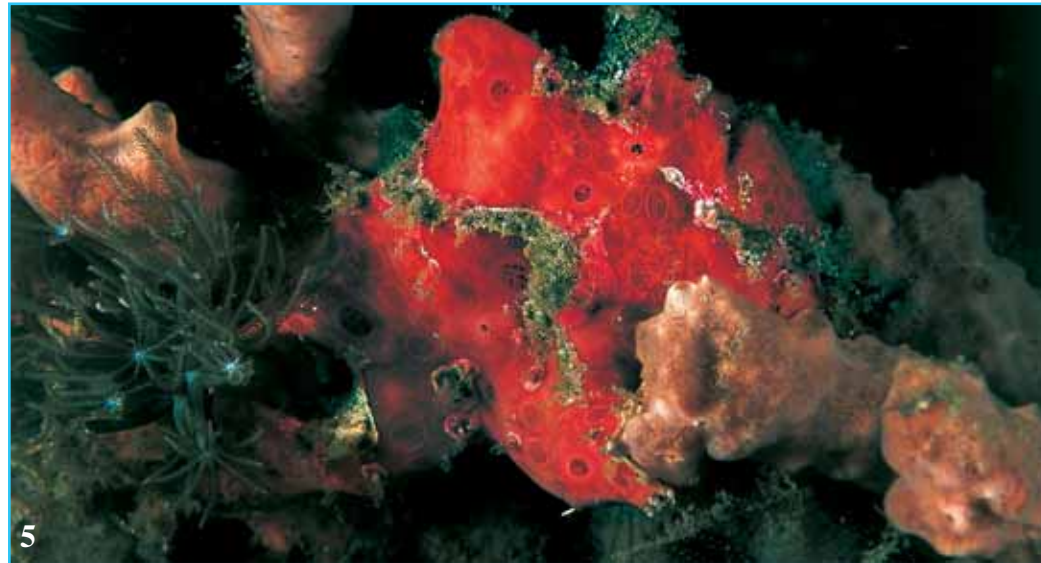
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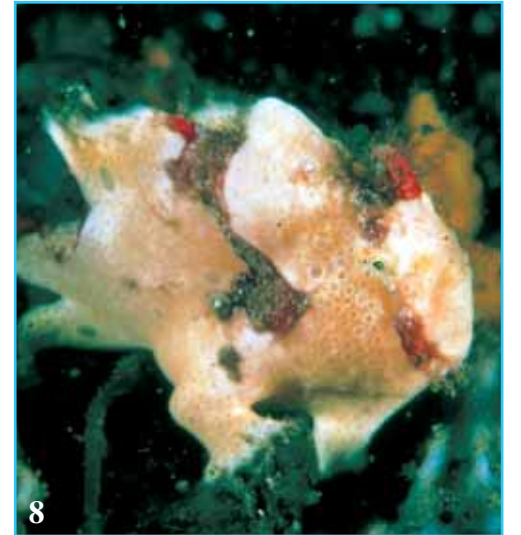
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9



Seahorses, ghost pipefishes, etc in the Lembah Strait

Common or spotted seahorse (*Hippocampus kuda*).

1&4. Likewise the robust ghost pipefish (*Solenostomus cyanopterus*), which often lives among sea grass, can match its colour to almost any surroundings. The little dragonfish (*Eurypegasus draconis*) can also "vanish"



3



2

against its background; it has a long rostrum with which it digs up tiny shrimps.

2&3. The harlequin ghost pipefish (*Solenostomus paradoxus*) can change its colour very rapidly to match new surroundings.



4



1

Scorpionfishes and others in the Lembah Strait

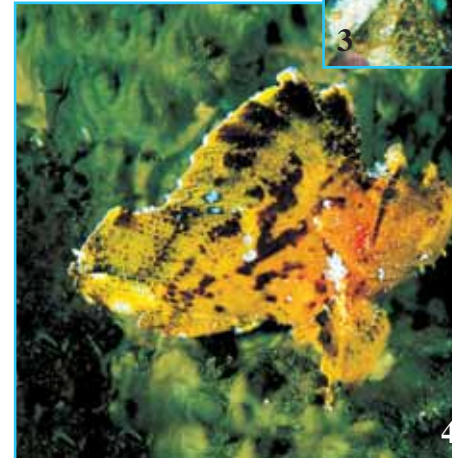
1. 11. The so-called walkman (*Inimicus didactylus*) is another member of the scorpionfishes; it "walks", so to speak, on the bottom on its pectoral fins, hence its name. 2. This fantastic pair seem to be deeply in love! They are mandarinfishes (*Synchiropus splendidus*). 3. The short-finned dwarf lionfish (*Dendrochirus brachypterus*) is common on reef flats and in shallow lagoons.



2



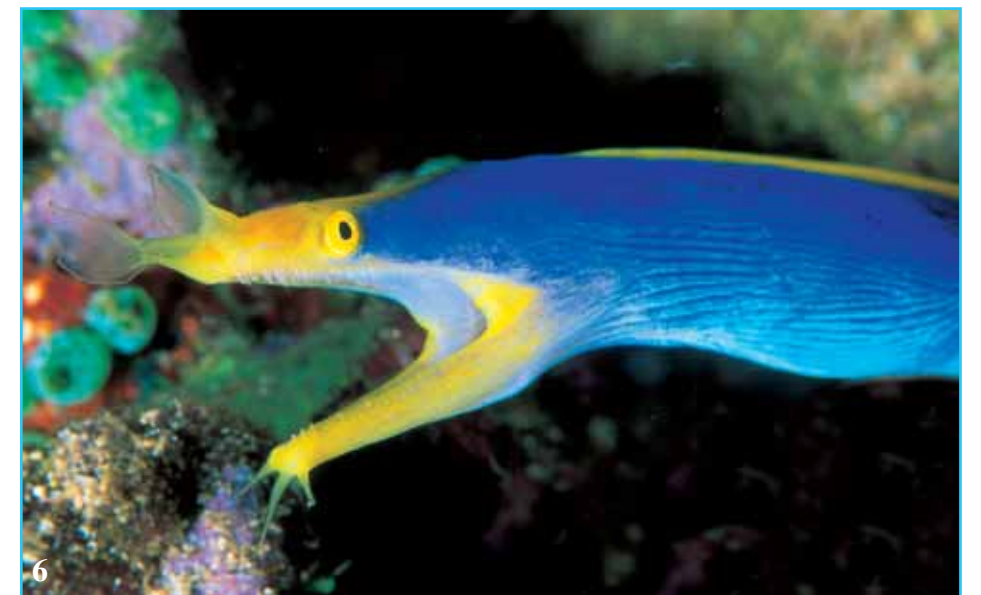
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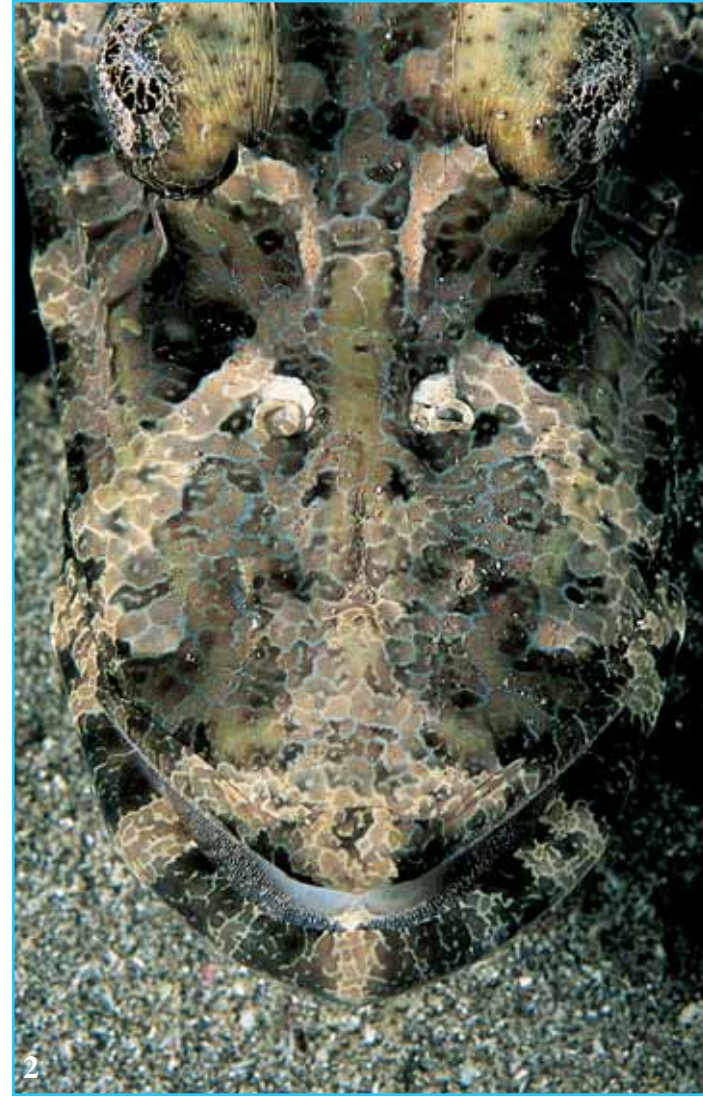


5



6

4. The leaf fish (*Taenianotus triacanthus*) is not very large (only 11 cm) but its colour-camouflage ability is excellent. 5. Bonapart's marine eel (*Ophichthus bonaparti*) has its own special method of concealment - it buries itself in black sand. 6. The ribbon eel (*Rhinomuraena quaesita*) is pitch black as a juvenile, and only later changes to this splendid blue and yellow. Its strange snout has made it one of the most photographed fishes in the Indo-Pacific.



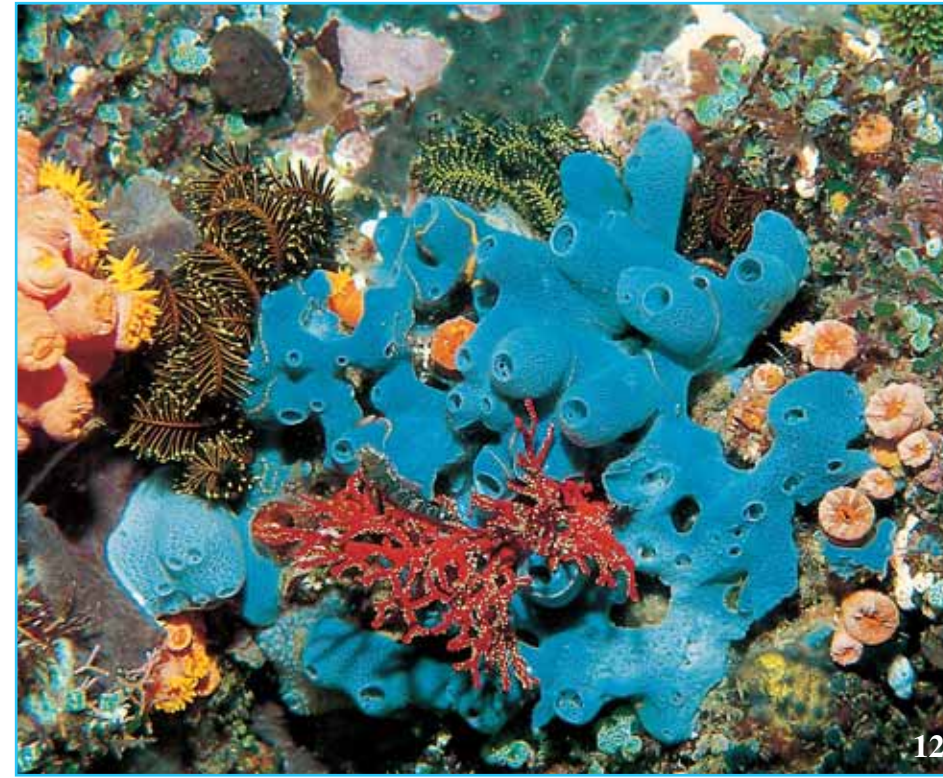
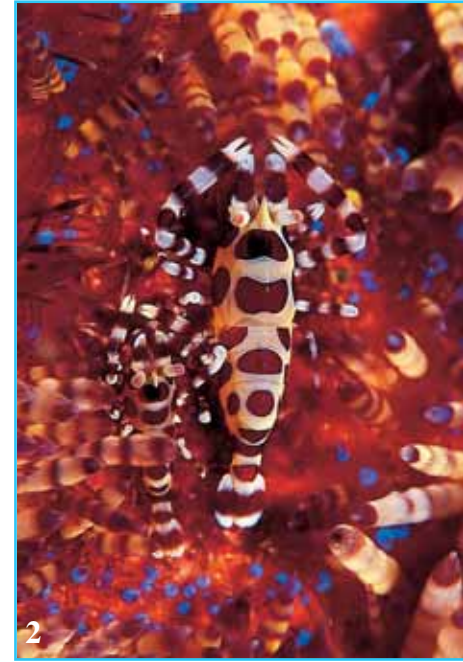
#### The monsters of the Lembah Strait

- 1+3. The author was unable to identify this "monster" buried in the black sand. Perhaps it was a stonefish.  
2. Head study of Beaufort's crocodilefish (*Cymbacephalus beauforti*), which lies flat on the bottom like a crocodile.



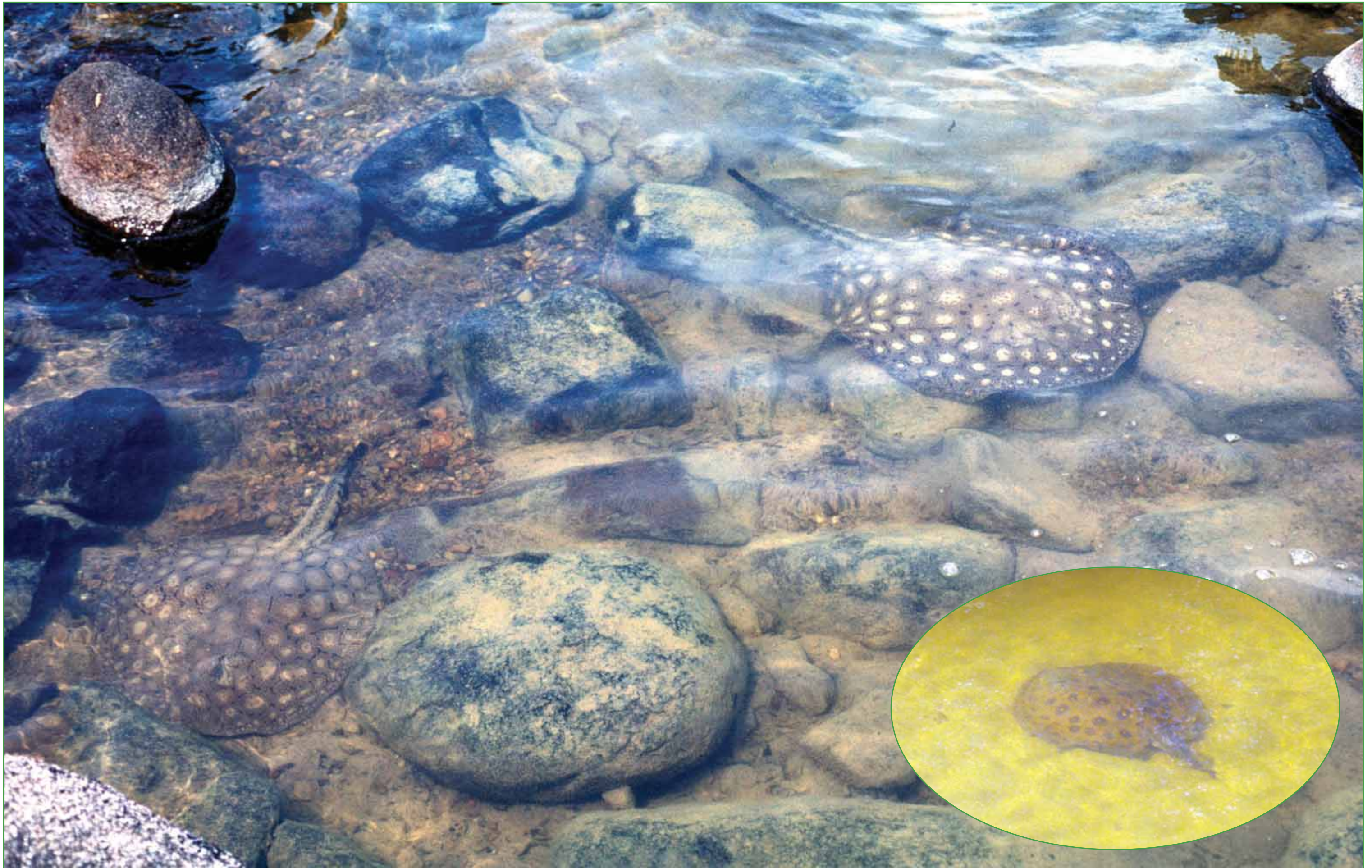
#### Monsters and molluscs in the Lembah Strait

4. *Cephalopods* were formerly thought to be monsters, but today they are a delicacy. This is a reef-dwelling *Sepia* species.  
5. The nocturnally active sea-slug *Pleurobranchus forskalii* is often to be seen in the Lembah Strait.  
6. So is the egg cowrie (*Ovula ovum*), only 7 cm long, which has a snow-white shell beneath its black mantle.



Marine life in the Lembeh Strait and how these creatures live in their habitat – to apply similar biotopes in the aquaria  
 1. Cardinalfishes (*Rhabdamia* sp.) form a living halo around a coral outcrop richly festooned with soft corals, crinoids, and sea urchins.  
 2. Coleman's shrimp, another commensal animal that is regularly seen on the surface of the fire urchin (*Asthenosoma varium*). 3. Squirrelfish (*Myripristis melanostictus*), Komodo Island. 4. Cardinalfish (*Apogon margartophorous*), Komodo Island. 5. Lined surgeonfish (*Acanthurus lineatus*), Komodo Island. 6. The highly ornate mandarinfish (*Synchiropus splendidus*) lives in reef crevices and is seldom seen. 7. The rare weedy scorpionfish (*Rhinopias frondosa*) is seldom seen by divers. 8. Commerson's anglerfish (*Atennarius commersoni*), Rinca Island. 9. The beautiful blue sea squirt (*Neptheis fascicularis*)

thrives below 15 m depth in cool waters off southern Komodo. 10. Aggregation of horned sea-stars (*Protoreaster nodosus*).  
 11. A 2 cm long goby (*Trimma macrophthalma*) shelters on a sponge next to a sea urchin. 12. Komodo's southern shore is encrusted with an amazing variety of marine creatures. The dominant organism seen here is a blue sponge. 13. Hundreds of these 6 cm long sea cucumbers (*Pentacta lutea*) are seen on nearly every dive off southern Komodo. 14. Feather star, Komodo Island. 15. This new species of cardinalfish (*Apogon* sp.) is known only from the Komodo group. 16. Filamentous wrasse (*Cirrhilabrus filamentous*), a rare fish seen only in Indonesian waters. 17. Splendid dottyback (*Pseudochromis splendidus*), western Flores Island. 18. Ribbon eel (*Rhinomuraena quaesita*), Kode Island.





Freshwater stingrays have grown in popularity in the last two decades as never before. Enthusiasts from around the world have built giant (some monster) aquariums with several hundreds of thousands of liters and I am not talking about public aquaria. But one can do with much less and have fascinating fishes in relative small aquariums, which I will show here. Almost all of today's freshwater stingrays in the hobby have their origin in South America, were most of the species occur. They belong to the family Potamotrygonidae and almost 30 species are described but many more await their scientific identification. I was able to record over 100 different pattern in stingrays throughout this continent east of the Andes, during the last 50 years, and additional new ones have shown up almost every year. I was also able to collect freshwater species in Thailand, Laos, Sumatra, Borneo and in Australia, as well as in several rivers of Africa. But these are rare to find in the hobby and as far as I know, no one has bred anyone of those in captivity (except for public aquaria). The freshwater stingrays have been bred now for a number of years, the first was recorded in the early 1970s in the Frankfurt Exotarium, one of the prime public aquaria at the time. Later in happened in others and since the late 1980s there is a boom. In the last 20 years thousands have been bred in captivity in the USA, Europe and in many parts of Asia and the majority today come from such breeding establishments. Especially since the export from Brazil, the largest producer (natural habitat and diversity) of freshwater stingrays, has banned the export quota many years ago and no one knows when they will open a new quota. Only Colombia, Peru and Paraguay have been shipping them since, but never in large numbers as the black species (*Potamotrygon leopoldi* and *P. henlei*), as well as the still not described pearl stingray, from the Rio Xingú and Tapajós system are not found in those exporting countries and everyone wants those... It is very sad that Brazil has banned the export, as those beautiful and very unique creatures are killed by every riverine caboclo as soon as they see one. Instead they could be shipped and would survive worldwide in aquaria were people love and take best care of them... But that is Mankind, with our aim to protect we will very soon find most of the "protected" species extinct. I want to give you some advice of how to keep them best. On the first double page you can see two natural habitats, one of an new still not described species grazing over rocks in the upper Xingú river and the insert is a *P. motoro* over typical sandy ground in the Rio Negro. And the sand, fine white or beige

sand, is what they need. This is where they search for food, where they protect themselves from predators and where they lay their life-born babies. So this is the most important for any biotope aquarium. The size of the tank depends on how many you want to keep. For instance on the left-hand side on top an authentic biotope from a small affluent to the Paraguay River in Paraguay. South of the metropolis Asunción, merge several smaller creeks into it (there is an aquatic labyrinth of rivers, lakes and creeks) and the one shown here is such a typical one. And such a creek contains a large diversity of fishes and is rich in aquatic vegetation (normally only known to such an extent from the Brazilian state of Mato Grosso were the Paraguay has its source). Smaller characoid fishes and dwarf *Corydoras* (swimming in open waters, rarely over ground) next to sucking catfishes (such as *Otocinclus*, *Cochilodon*, *Ancistrus*) as well as cichlids of the genera *Apistogramma* and *Gymnogeophagus*, and bottom living characoids such as *Parodon* and *Characidium* species, and even freshwater stingrays enter such sandy habitat frequently. Here lives the most southern and endemic *P. brachyura*. This is a 450 Liter aquarium and I have one in it with 8 *Gymnogeophagus meridionalis*, 6 *G. rhapsodus*, 10 *Apistogramma* sp., 30 *Aphyocharax paraguayensis* and 30 *A. rathbuni*, 15 *Mimagoniatus inequalis*, 5 *Parodon affinis*, 20 *Otocinclus* sp., 5 *Cochilodon* sp., 12 *Corydoras paleatus* "high fin" and 25 free swimming tiny *Corydoras pygmaeus*. One can see how the stingray grazes over the plants looking for food, but not fishes! He is searching, as in nature for tad pools (as the *P. motoro* in the centre photo doing it in nature), one of their preferred foods. Besides sand, just as mentioned same lower plants *Eichhornia azurea*, *E. diversifolia*, *Eleocharis acicularis*, *Heteranthera zosterifolia*, *Lemna minor*, *Phyllanthus fluitans*, *Lilaeopsis brasiliensis*, *Ludwigia inclinata*, *Cabomba furcata* and *Myriophyllum aquaticum*. In such an authentic biotope the larger cichlids

have started immediately to lay eggs, and play, as in nature (see also last photos left-hand page) The chemical water parameters in this biotope were pH 5.9-6.5, the conductivity between 28-34  $\mu\text{S}/\text{cm}$  and temperatures from 26.7-28.3°C (in their winter the water temperature can drop down to 19°C and even lower). The decoration consisted of different stones and white sand 1-9 mm as well as Aquaria gravel 2-4 mm and driftwood. It should have a strong external large biological filter and light bulbs for plants and colour for fishes. One can read more about it on my website: [www.aquapress-bleher.com](http://www.aquapress-bleher.com) Another authentic freshwater stingray habitat (center photo and lower left on the left-page) is this sandy and stony island-biotope in the Mapuera, the largest right-hand affluent of the Rio Trombetas in the state of Pará, Brazil. The river has its source along the border with Guyana and during extreme floods it connects to the nearby source of the Rio Essequibo system (that is why some Guyana fish species can be found here as well, like the real *Anostomus anostomus*). The Mapuera itself is full of cataracts, a natural barrier for many species. But in such a biotope as shown, lives very large fish diversity. Most are characoids, catfishes but also stingrays and cichlids, which are visitors. Aquatic vegetation is almost absent except for some floating plants and possibly large *Echinodorus* and *Cyperus*, which grow out of the water and *Spatiphyllum wallisii* along the edges. Some freshwater stingrays like *Potamotrygon motoro* and *P. yepizi* occur here. Besides those 3 I placed in the 1600 liter aquarium 2 large *Phractocephalus hemiliopterus*, 2 *Sorubim lima*, 1 *Pterygoblichthys multiradiatus*, 2 *Panaque nigrolineatus*, 4 *Luciopimelodus pati*, larger characoids such as 3 different *Myleus*-species total of 22, 10 of each *Poptella obercularis* and *Tetragonopterus* species, 15 *Anostomus anostomus*, 12 *Bryconops* sp., 8 *Boulengerella lateristriga* and *B. xyrekes*, and plants as mentioned above aquatic plants are very rare in such a biotope. Along the edges one can plant large *Echinodorus*, *Cyperus* and *Spatiphyllum* species, which will also out of the water, as in nature (they are only submerged during the rainy season in nature). Some floating plants like *Ceratopteris cornuta* can be added, which is good. The chemical water parameters in the Rio Mapuera biotope were from pH 5.5-5.85, the conductivity between 14-20  $\mu\text{S}/\text{cm}$  and temperatures from 28.5-29.5°C. Use for such a aquarium two large external filters. The decore elements should consist of mangrove roots, red-brown lava stone, reddish aquarium gravel 2-4mm and whitish gravel size 5-8mm, as well as fine sand. You can also read more also under [www.aquapress-bleher.com](http://www.aquapress-bleher.com)







The fishes of the genus *Symphysodon* are probably the most asked for and highest prized ornamental aquarium fishes worldwide (except for Arowanas in Asia) and fascinate people on 5 continents more than any other freshwater fish since the 1960s. Although most discus today come from breeding establishments (nearly 20 million breed each year) the wild (hardly 30,000 collected in the Amazon basin each year) are or have again (after the publication of my large book *Bleher's Discus* volume 1 – see advert in this issue or [www.discus-skat.ru](http://www.discus-skat.ru)) become very popular around the globe. The interest in authentic biotopes, such as those where these fishes live in nature, has suddenly taken off, in a way it is almost not believe. And the love for natural coloured discus is booming like never before. Therefore I want to give you 3 typical discus biotope aquarium examples, but if anyone is really interested in keeping these fantastic nature animals you should read my book, just for the sake of these lovely animals (and not because of me – sincerely).

**1. Biotope of a 1600 liter aquarium: Lake Cuipeuá, Amazon, Brazil.**

Cuipeuá is a smaller lake located west from the city Alenquer in the state of Pará in Brazil. There is a single native village of fishermen along its northern shore and the lake is surrounded by growth of large grass, which is submerged during high water period. There are some trees, but most of the area is deforested for cattle and buffalo farming. The lake connects with the Rio Curuá and other bodies of water in the Alenquer region during the floods. The discus and their mates, such as angelfishes, larger earth eaters and other cichlids, loricariids and large characoids live in such a biotope as shown, in very large groups. Aquatic vegetation is almost absent except for floating plants and some large *Cyperus* along the edges.

**Fishes:** *Symphysodon haraldi* – blue and brown (red) discus (50), *Pterophyllum scalare* (9); *Geophagus* sp. (2); *Mesonauta* sp. (11) and *Loricariichthys* sp. (5). Floating plants like *Eichhornia crassipes*, *Pistia stratiotes*, *Utricularia* species, *Azolla caroliniana* and many *Ludwigia helminthorrhiza* can be found. And some large *Cyperus* standing along the lake edges. This lake Cuipeuá has for years been confused (used) as Curiperá, a lake that does not exist in the Alenquer region were these fishes are coming from. Here one can see that there is one alpha



animal and also a fully striped male, called “Royal Blue”, and a more Cuipeuá-like brown, with some reddish colours. (The extreme reddish discus as often identified with the name Curiperá, or by some now correctly as Cuipeuá, are very rare.) Cuipeuá is one of the few lakes where discus hide among the submerged grass during the lower water season and this is the only time (one month out of

12) that discus can be collected here. The fishermen circle the grass and catch an entire large group (one as shown). Here the discus can find lots of aquatic insects among the grass, algae and terrestrial insects and that is why they come here during that short period. A few angelfishes swim along most of the time as they feel protected within the large discus group, also *Mesonauta* species



but more in the upper water region. Loricariids and cichlids dwell over the sandy ground, filtering out the sand (as discus do) for micro-organisms. In this authentic display one can see how discus live with their young – 48, almost one year old discus, with their parents (the fully striped and the red discus). The decoration is biotope-correct, as seen by me in Cuipeuá during raising water. **The chemical water parameters** in the Lago Cuipeuá were from pH 6.53, the conductivity between 19  $\mu$ S/cm and temperatures from 26.3-26.9°C. Two large external biological filters. Décor material white fine sand as well as Aquaria white gravel 01-09 mm. Mangrove roots and possibly some round stones.

**2. Biotope of a smaller aquarium** with 300 liter (above right), authentic biotope from the **Rio Mineruá**. This is a black water river, flowing in to the smaller right arm of the giant Rio Solimões, located east of the town of Fonte Boa in Amazonia, Brazil. The local environment is, for the most part, still in tact. Unspoiled nature can still be experienced in the rivers and lakes of this area. The bottom substrate is pure white sand. Tree branches hang in to the river and a lot of tree roots are laying around. Everywhere unspoiled nature. The habitat on display here features varieties of angelfish and green discus, types of fishes that are being presented here to

the public for the very first time. Green Discus (*Symphysodon aequifasciatus*) an angelfishes (*Pterophyllum scalare* var.). **Plants:** None. At the most, some floating plants, like *Pistia stratiotes* and *Utricularia foliosa*, as well as *Azolla* sp. Until a few years ago nobody knew this region from an aquarium hobby perspective. Only after I was able to show the existence of the Green Discus in this area, did the aquarium hobby hear about it for the first time. The area is nearly uninhabited and has so far been unexplored from an ichthyological perspective. The specimens on display here have been collected by myself and were then brought back to Germany towards the end of 2004. In addition, there are also some loricariids. The fishes shown here are unique specimens; the angelfishes with fascinating gill cover markings and a jet-black, separated anal fin (so far unknown from any *P. scalare*). The green discus specimens, on the other hand, have a golden yellow to orange base coloration, which has also never been seen before in this type of discus. **The water values were as follows:** pH 5.4-5.8, conductivity 12-18  $\mu$ S/cm and temperatures from 27-29 °C. Large external biological filter and the decoration. Water-logged roots, fine-grained white sand (0.1-0.9 mm).

**3. Biotope of a 1600 liter aquarium** (top and

above left) is from the **Jatapu**. The Rio Jatapu is an affluent of the Rio Uatumã and the latter is a major left-hand affluent of the Amazon River and has black water, like all the *Symphysodon discus* (the so called Heckel-discus) habitats. I have decorated here a typical biotope of this region during rising water, when the trees become submerged. Also here the water rises more than 10 meters. It is a typical group of 50 large Heckel-discus. They live with *Mesonauta* species, *Uaru*, *Geophagus*, larger loricariids and rarely large *Crenicichla* or *Cichla* species. The latter normally only enter their territory. But live also over fine sand, were they blow into it (see above left) in search for food. **Fishes:** 50 *Symphysodon discus*, 6 *Mesonauta* sp., *Pterygoblichthys* sp. 4, *Uaru* sp. 4 and 6 *Biotodoma cupido*. **Floating plants** like *Eichhornia crassipes*, *Pistia stratiotes*, *Utricularia* species. This river is often in popular and scientific literature confused, some claim that blue and Royal blue discus are found here, but that is a fake. The Jatapu region consists of Heckel-discus and the blue are only found in the Uatumã **The water values were as follows:** pH 5.0, conductivity 9  $\mu$ S/cm and temperatures from 29°C. Large external biological filter and the decoration water-logged roots, fine-grained white sand (0.1-0.9 mm).





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